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Ecological considerations on *Paragaleodes occidentalis* (Simon, 1885) in Algeria (Arachnida: Solifugae)

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Abstract

This note concerns the ecological considerations of the sun-spider species *Paragaleodes occidentalis* (Simon, 1885). It refers to observations and collections of this species between 2006 and 2019, under stones and between grasses in several localities of North Algeria. While solifuges are typically restricted to arid ecosystems, the present species was collected in semi-arid and sub-humid climate showing a great ecological valence with affinity to forests biotope and medium altitude montane landscape. The presence of adult males and females in May 2019 living in the same area, indicate the earliest time for the beginning of mating for this species.

Keywords: Solifuges, Ecological considerations, *Paragaleodes occidentalis*, Algeria.

Introduction

The Solifugae are an order of arachnids that are known by a variety of common names such as camel spiders, wind scorpions, and sun-spiders, referring to various aspects of their morphology or biology (Harvey, 2013; Bird *et al.*, 2015). This order is represented by roughly 1110 species (Blick & Harvey, 2011). They inhabit tropical and subtropical desert regions in Africa, Asia, and the Americas (Punzo, 1998a). Solifuges are a poorly studied group of arachnids in the world (Harvey, 2002).

In Algeria, El-Hennawy (1999) noted 24 species of sun-spiders within 14 genera in 5 families. But genus *Paragaleodes* Kraepelin, 1899 was not reported in this country. Recently, Harms & Dupérré (2018) indicated this genus in Algeria as a synonym of *Galeodes* with one species *Paragaleodes occidentalis* (Simon, 1885) but without precision of localities and ecological behaviour.

Genus *Paragaleodes* Kraepelin, 1899 includes 12 species recorded from 7 African and 12 Asian countries (Harvey, 2003).

This note is the first ecological consideration on the species *P. occidentalis* in Algeria, based on material deposited in Laboratory of Zoology, University of Ghardaïa (Algeria) and material recently collected from several localities.

Material and Methods

Study area

The material of *P. occidentalis* was collected from tree regions in North of Algeria: Batna and Guelma in North-east and Sidi Bel Abbès in North-west. The majority of these areas are composed of altitudinal steppes and highlands that belong to bioclimate generally semi-arid with a cold winter (3-10°C) with maximum temperatures in July (30-35°C) (Benabdeli, 1976; Bensaid, 2006; Chenchouni *et al.*, 2010) and in the north limits some regions with sub-humid climate where the maximum temperature is recorded in August (25-28°C) (Bechiri, 2011). The annual average of rain precipitation is about 300-350 mm in Batna and Sidi Bel Abbès and among 500-550 mm in Guelma.

This investigation was conducted largely in steppe regions with dominance of Alpha (*Stipa tenacissima* L.) and in the forests of Algerian Tell Atlas with Aleppo pine (*Pinus halepensis* Miller) with reddish-brown to sandy-red soil (Halitim, 1988), covered with herbaceous vegetation of generally Diss (*Ampelodesmos mauritanicus* (Poir.)) and Rockrose (*Cistus* sp.) in the North-east and Harmal (*Peganum harmala* L.) in the North-west.

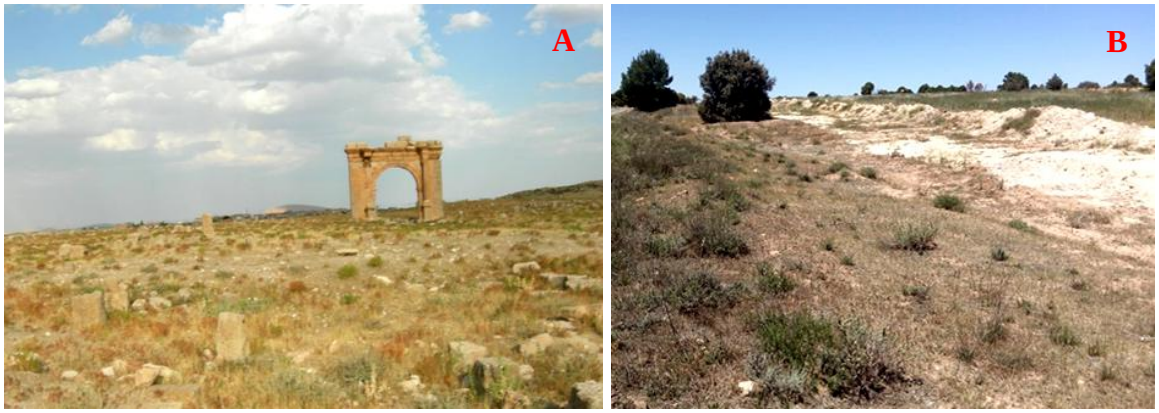

Fig. 1. Natural habitat of *P. occidentalis*: A. Batna locality, typical steppe formations. B. Sidi Bel Abbès locality, typical montane formations.

Sampling of Solifuges

Most solifuges are nocturnal (Cloudsley-Thompson, 1961) but, there are a number of diurnal species that are quite active during the hotter parts of the day (Punzo, 1998a). That makes Solifuges secretive in nature and difficult to observe and to collect in the field.

Some species utilize less permanent depression burrows under rocks, while others can be found within rock crevices or beneath decaying vegetation or cow chips (Lawrence, 1963; Brookhart, 1972; Gore & Cushing, 1980).

In this work, the solifuges were observed and hand-captured during the summer period from under stones (Fig. 1A) and between grasses, showing an affinity to herbaceous habitats (Fig. 1B).

Identification of the species was according to the key of Roewer (1934).

Taxonomic situation of the studied species (Harvey, 2013):

Family **Galeodidae** Sundevall, 1833
Genus ***Paragaleodes*** Kraepelin, 1899
Paragaleodes occidentalis (Simon, 1885) (Fig. 2)

Synonyms:
Galeodes barbarus Lucas: Simon, 1879a: 102-103, fig. 4 (misidentification).
Galeodes occidentalis Simon, 1885c: 44; Roewer, 1934: 534; Zilch, 1946: 146.
Paragaleodes occidentalis (Simon): Kraepelin, 1899b: 204; Kraepelin, 1899c: 376; Kraepelin, 1901a: 25-26; Kraepelin, 1908c: 214, fig. 40; Simon, 1909a: 41; Berland, 1932: fig. 39; Harvey, 2003c: 275.

Type locality: Morocco.
Distribution: Algeria, Mauritania, Morocco.

Material examined

The number of studied specimens: 2 ♂♂ & 4 ♀♀ from: **Algeria**, **Region of Batna**, Zana El Beida (35°46'N, 06°04'E), in steppe formation, 824 m, 27/VII/2006 (S.E. Sadine). **Region of Guelma**, Ain Mekhlouf (36°17'N, 07°14'E), in montane landscape, 860 m, 2/VIII/2017 (S.E. Sadine). **Region of Sidi Bel Abbès**, Merine (34°57'N, 00°30'E), in montane landscape, 700 m, 13/V/2019 (M. El Bouhissi). **Region of Sidi Bel Abbès**, Merhoum (34°25'N, 00°15'E), in steppe formation, 1143 m, 29/V/2019 (M. El Bouhissi). Material is deposited in Laboratory of Zoology, University of Ghardaïa, Algeria.

Fig. 2. *Paragaleodes occidentalis* in natural habitat. A. Male alive in steppe formation of Merhoum region (Sidi Bel Abbès). B. Female alive in montane landscape of Ain Mekhlouf Region (Guelma).

Ecological considerations

The arachnid order Solifugae is distributed over the Afrotropical, Nearctic, Neotropical, Oriental, and Palaearctic regions (Blick & Harvey, 2011). As shown in introduction, solifuges are typically of tropical and subtropical desert regions in Africa, Asia, and the Americas (Punzo, 1998a) and some camel spiders are described as endemic indicators of desert biomes worldwide **(**Schmoller**,** 1970).

The distribution of *P. occidentalis* in North Algeria, is occurring in the highlands region from Tunisia (east) to Morocco (west) with a relative altitude between 800-900 m (Fig. 3).

Several studies have stated that solifuges are typically restricted to arid ecosystems (Cloudsley-Thompson, 1961; Punzo, 1998a). In our note, this species was collected in two different ecosystems at the same time: steppe in semi-arid climate and montane landscape in sub-humid climate, showing a great ecological valence and ability to colonize many habitats, supporting variations of ecological factors such as temperature, humidity, and elevation.

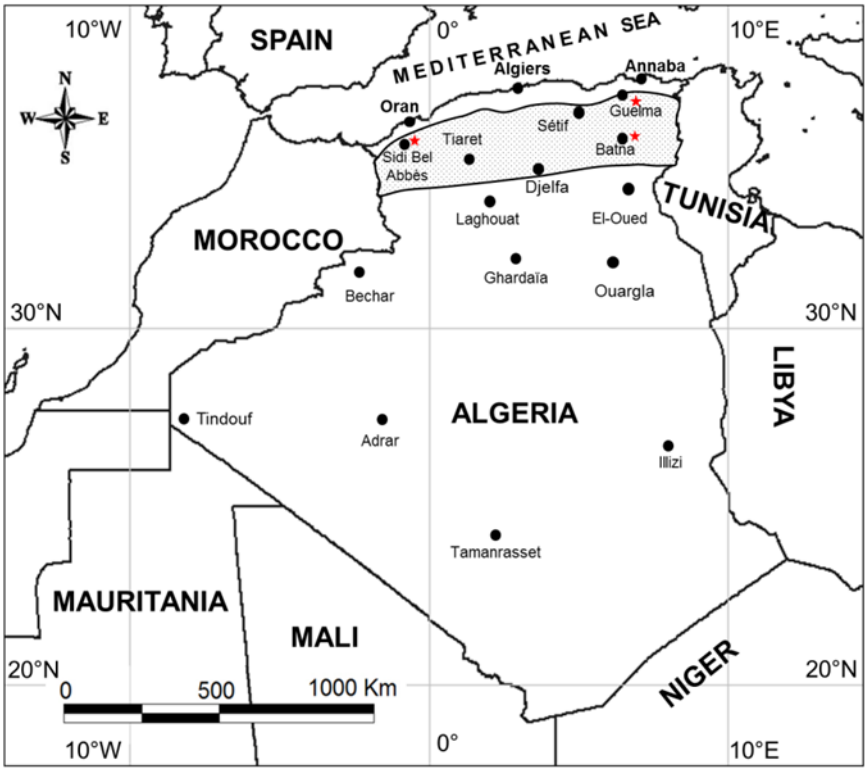

Fig. 3. Map of Algeria showing the distribution of *Paragaleodes occidentalis* (dashed area). Red stars = sampled localities.

In Merhoum region (Sidi Bel Abbès), adult males and females were observed in May 2019 occupying the same area (distance between individuals is less than 500 m). That probably shows the earliest time of the beginning of mating season for this species. Because no species of Solifugae are known to live in groups and adult solifuges are solitary, they are highly aggressive and do not tolerate similar types of communal aggregations (Polis & Sissom, 1990; Foelix, 1996; Punzo, 1998a) and mating activity occurred most frequently in June (26%) and July (54%) (Muma, 1963; Punzo, 1998a).

During the sampling period, some females were gravid (with fertilized eggs) (Fig. 4) showing that birth period or the egg-laying (oviposition) for this species can be soon in

June-July. Similarly, *Eremobtes marathoni* Muma & Brookhart, 1988 that inhabits sandy arroyos and adobe-soil flats with scattered clumps of vegetation, has gravid females observed from the middle of June through the third week of July (Punzo, 1998b).

Fig. 4. Gravid female of *Paragaleodes occidentalis* in Merhoum region (Sidi Bel Abbès).

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Second record of *Loxosceles rufescens* (Dufour, 1820) (Araneae: Sicariidae) from Iraq

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Abstract

The recluse spider *Loxosceles rufescens* (Dufour, 1820) was recorded for the first time from Ninawa, North of Iraq by Reimoser (1913). Now it is recorded for the second time from the locality of Abu-Alkhaseeb in Basrah south of Iraq. Both males and females were collected, their general habitus and genitalia are illustrated. New locality data of this species are also given.

Keywords: Spiders, Sicariidae, *Loxosceles*, new locality, Basrah, Iraq.

Introduction

The recluse spiders (Sicariidae: *Loxosceles*) or Mediterranean Fiddle-Back spiders are cosmopolitan, but most common in the tropics. The medical importance of recluse spiders is because of their ability to occasionally causing significant skin necrosis called Loxoscelism (Vetter, 2008). *Loxosceles rufescens* (Dufour, 1820) is a cosmopolitan species that occurs around the entire Mediterranean region, southern Europe, northern Africa to Iran, introduced to USA, Mexico, Macaronesia, South Africa, India, China, Japan, Korea, Laos, Thailand, Australia, Hawaii (World Spider Catalog, 2019). The first record of *Loxosceles rufescens* from Iraq was given by Reimoser (1913) from Tschil-Miran Peak in Jabal Sinjar (Ninawa Governorate) (Zamani & El-Hennawy, 2016). We could find it for the second time from another locality in Iraq: Abu-Alkhaseeb district, Basrah. Photographs and measurements of male and female genitalia as well as their habitus are here presented.

Material and Methods

The study was based on the specimens collected from the fields of Abu-Alkhaseeb district, Basrah, south of Iraq (Fig. 1), by using pitfall traps and hand collecting from leaf litter and under rocks. Twenty specimens were obtained: 6 males and 14 females. All specimens were preserved in 80% ethanol and deposited in Natural History Museum of Basrah University.

Specimens were examined and photographed using LEICA EZ 4HD stereomicroscope. The specimens were identified depending on external morphology and structure of genitalia using the papers of Lotz (2012, 2017). All measurements are in millimetres.

Fig. 1. Map of the new collecting locality of *Loxosceles rufescens* (Dufour, 1820), from Abu-Alkhaseeb district, Basrah, south of Iraq.

Results

Loxosceles rufescens (Dufour, 1820)
Collected specimens: 6♂♂, 14♀♀, Abu-Alkhaseeb district, Basrah, south of Iraq (30º26'28"N, 47º58'21"E), August-September 2018, leg. Shurooq Abdullah Najim.
Descriptive notes: Medium-sized, haplogyne, six-eyed spiders. Male has simple palpal organs, female without sclerotized epigyne.

Male: (Fig. 2A) total body length 6.5, cephalothorax length 2.8, width 2.6.
Palp: (Figs. 2B-C) tibia is prolonged. Embolus is about as long as the width of the globular bulb. Measurements of male palp segments: Femur: length 0.8, width 0.1. Patella: length 0.2. Tibia: length 0.5, width 0.3. Cymbium: length 0.2, width 0.3. Bulb: length 0.2, width 0.2. Embolus: length 0.2.

Female: (Fig. 3A) total body length 7.6, cephalothorax length 3.2, width 2.9 (Figs. 3B-C). External genitalia: (Fig. 3D) white, dimpled, its parts are near each other at the midline and are identified by a single large rounded lobe. Length 0.4, width 0.4.

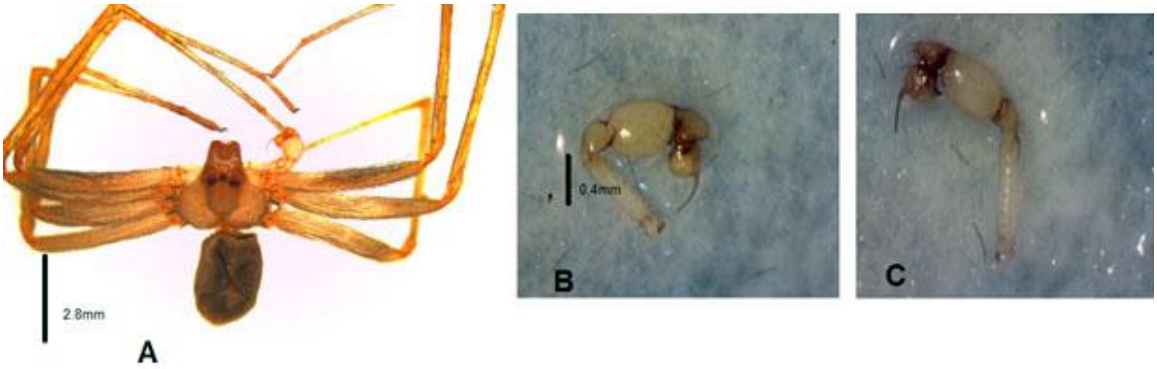

Fig. 2. *Loxosceles rufescens* (Dufour, 1820) ♂. A. Habitus, dorsal view. B-C. left palp. B. prolateral view. C. retrolateral view.

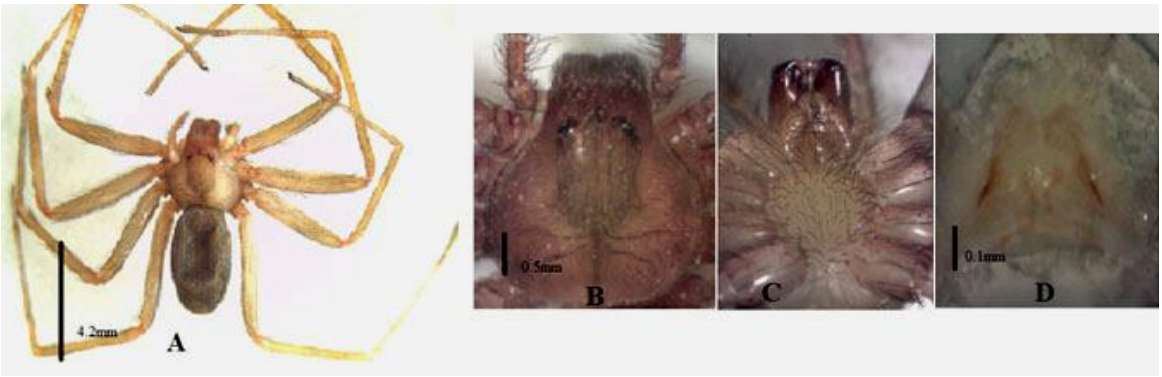

Fig. 3. *Loxosceles rufescens* (Dufour, 1820) ♀. A. habitus, dorsal view. B-C. Prosoma. B. dorsal view. C. ventral view. D. External genitalia, ventral view.

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The first record of long-jawed spider *Tetragnatha nitens* (Araneae: Tetragnathidae) from Iraq

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Abstract

The species *Tetragnatha nitens* is recorded for the first time from Iraq. Its general habitus and genitalia are illustrated. Locality data of this species are also given.

Keywords: Long jawed spider, *Tetragnatha*, first record, new locality, Basrah, Iraq.

Introduction

Family Tetragnathidae Menge, 1866 has a worldwide distribution and is most diverse in the tropics, with the species often found in wet areas (Álvarez-Padilla *et al.*, 2009). It belongs to Infraorder Araneomorphae; first described by Anton Menge (1866). It currently contains 48 genera and 1001 species (World Spider Catalog, 2019).

Tetragnatha Latreille, 1804 is one of the most widespread and abundant orb-weaving spider genera (Levi, 1981) and it is one of the largest genera of spiders comprising of 338 species and 11 subspecies. The species of genus *Tetragnatha* live in tropical, temperate, and arctic climates.

According to the list of Iraqi spiders (Zamani & El-Hennawy, 2016), one species of *Tetragnatha* has been recorded from north of Iraq, *Tetragnatha extensa* (Linnaeus, 1758); its first record was given by Reimoser (1913).

In the present study *Tetragnatha nitens* (Savigny, 1825) is recorded for the first time from Iraq in Basrah province. Both male and female are described with their habitat and genitalia.

Material and Methods

The specimens of *Tetragnatha nitens* (Savigny, 1825) were collected from the shrubs near the water resources by using sweeping net and hand collecting methods during day time from temporary marshes region belong to Al-Hammar Al-Sharqi in Basrah province (Fig. 1), during the period between January and June 2019, preserved in 80% ethanol, and deposited at natural history museum of Basrah University. They were examined by using Leica EZ 4HD stereomicroscope and identified according to Vungsilabutr (1988). All measurements are in millimetres.

Fig. 1. Map of collecting locality of *Tetragnatha nitens* (Savigny, 1825) from Al-Hammar Al-Sharqi marsh, Basrah province, south of Iraq.

Taxonomy

Family **Tetragnathidae** Menge, 1866
Genus ***Tetragnatha*** Latreille, 1804
Tetragnatha nitens (Savigny, 1825)

Taxonomic references:
Eugnatha nitens Savigny, 1825: 323, pl. 2, f. 2 (D♀).
Eugnatha pelusia Savigny, 1825: 325, pl. 2, f. 3 (D♂♀).
Tetragnatha gracilis Lucas, 1838: 43, pl. 6, f. 8 (D♀).
Tetragnatha nitens Walckenaer, 1841: 209.
[For complete list of references and synonyms, see World Spider Catalog (2019).]

Material examined: 13 ♂♂, 22 ♀♀, Basrah province, temporary marshes of AL-Hammar AL-Sharqi, south of Iraq, 30º42.217'N, 47º25.182'E.

Description

Male: measurements: total body length with chelicerae 12 (Fig. 2, A-B), without chelicerae 8.5; carapace length 3.5, width 2.0; abdomen length 5.1, width 1.5.
Carapace: yellowish brown, oval, widest near the middle flattened, fovea as a pit. Eyes: eight in two groups.
Sternum: yellowish brown with brown margins.
Chelicerae: length 3.5 (Fig. 2, C-D), as long as carapace, well developed, armed with 9 teeth on promargin and 11 on retromargin, in addition to 3 apical conspicuous teeth.
Endites: yellow, with dense hairs.
Labium: brown.

Fig. 2. *Tetragnatha nitens* (Savigny, 1825) ♂. A-B. Habitus. A. dorsal view. B. ventral view. C-D. Left chelicera. C. prolateral view. D. retrolateral view. E-L. Left palp. E. prolateral view. F. ventral view. G. retrolateral view. H. tegulum. I. paracymbium. J. cymbium. K. embolus and conductor. L. cymbium and paracymbium.

Palp: (Fig. 2, E-L) tegulum transverse (Fig. 2, H), paracymbium bifurcate apically (Fig. 2, I), conductor with subapical notch, embolus long filiform surrounded with conductor (Fig. 2, K), cymbium separated with paracymbium (Fig. 2, L).

Legs: yellow, slender, long and spiny.
Abdomen: light yellow with some dark spots, 3-5 as long as wide, not pointed.

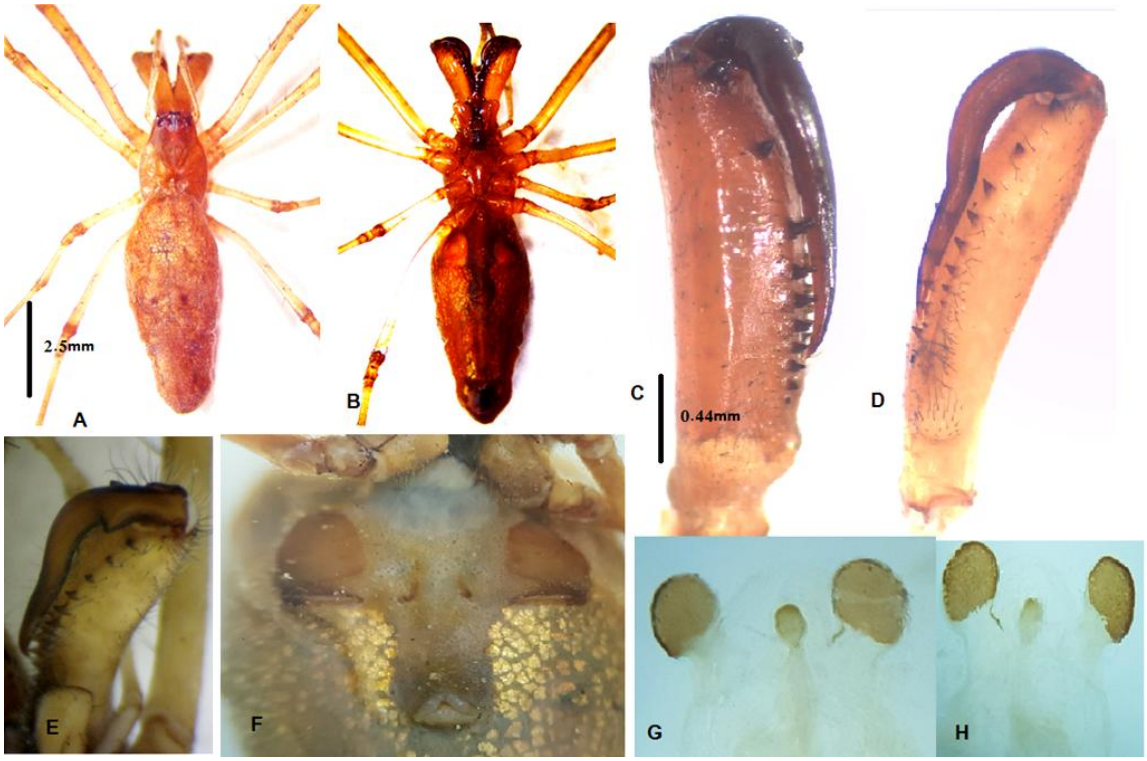

Fig. 3. *Tetragnatha nitens* (Savigny, 1825) ♀. A-B. Habitus. A. dorsal view. B. ventral view. C-D-E. Left chelicera. C. prolateral view. D. retrolateral view. E. small tooth at the base of fang. F. Genital fold. G-H. Epigyne. G. dorsal view. H. ventral view.

Fig. 4. Habitat and webs of *Tetragnatha nitens* (Savigny, 1825) at Al-Hammar Al-Sharqi marsh, Basrah province.

Female: measurements: total body length with chelicerae 14.0 (Fig. 3, A-B); carapace length 3.0, width 2.5; abdomen length 8.0, width 3.0.
Carapace: longer than wide, yellowish brown.

Chelicerae: 3.0 length (Fig. 3, C-D), yellowish brown, well developed and protruded forwards, fang with a tooth at the base (Fig. 3, E).
Abdomen: elongated and cylindrical shaped, dorsum yellowish brown with silvery white scale decoration and dark brown longitudinal stripes.
Epigyne: genital fold long and narrow (Fig. 3, F), copulatory opening hat-like located downwards, with deep notch in anterior and concave in posterior margin, vulvae with a pair of receptacles, beside the median structure (Fig. 3, G-H).

Habitat: The specimens were collected from their webs which were built on shrubs, herbs, and low plants near the water sources of the study region (Fig. 4).

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Serket (2019) vol. 17(1): 15-20.

A new record of two-tailed spider genus *Hersilia* Savigny, 1825 of the fauna of Bangladesh (Araneae: Hersiliidae)

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Abstract

The two-tailed spider *Hersilia savignyi* Lucas, 1836 of the family Hersiliidae is a new record for the fauna of Bangladesh. Generic diagnosis and distribution are provided together with the description of the species.

Keywords: Araneae, Hersiliidae, *Hersilia*, New record, Bangladesh.

Introduction

Spiders of the family Hersiliidae (two-tailed or long-tailed spiders) are one of the attractive and peculiar group of arachnids in the gardens and forests. These are tropical and semi-tropical in distribution and currently contains about 182 species under 16 genera in the world fauna (World Spider Catalog, 2019). Members of the genus *Hersilia* Savigny, 1825 are very common in the gardens and forests of Bangladesh. They do not make any web and always stay on the body of the shrubs and trees on which they run very quickly. Sometimes they make typical nests with the barks into which the females lay eggs and development of the spiderlings take place there.

The genus *Hersilia* was first established by Savigny in Audouin (1825) with the type-species *H. caudata* Savigny, 1825. It is represented by 78 species worldwide (World Spider Catalog, 2019). In Asia, the genus was first reported by Lucas as *Hersilia savignyi* in 1836 from India and Sri Lanka. Till date, only 14 species are recorded in this region (Lucas, 1836; Thorell, 1895; Sinha, 1951; Tikader, 1977; Tikader & Biswas, 1981; Yaginuma, 1986; Song & Zheng, 1982; Wang & Yin, 1985; Baehr & Baehr, 1987, 1993;

Barrion & Litsinger, 1995; Sen, Dhali, Saha & Raychaudhuri, 2015) but there is no previous record of this genus in Bangladesh (Okuma *et al.*, 1993; Biswas *et al.*, 1993; Begum & Biswas, 1997; Biswas, 1995).

Hersilia spiders are tropical and semi-tropical occurring always on the body of the trees vertically where they can run very quickly. The present paper contains description of *H. savignyi* Lucas, 1836 recorded for the first time from Bangladesh. Generic diagnosis and distribution are provided together with the description of the species.

Spiders of genus *Hersilia* are one of the important bio-control agents of the forest insect pests of Bangladesh. So, their study is very important in the identification and conservation practices of the endangered forest spiders of the country. Also, maximum use of these natural enemies will help in the future forest pest-ecosystem management.

Material and Methods

This study was made with the collecting of specimens from the gardens of different districts of Bangladesh. After sorting, all the specimens were preserved primarily in 70% ethanol and after identification the specimens were finally preserved in Audmans' preservatives (90 parts 70% ethanol + 5 parts glacial acetic acid + 5 parts glycerine) following Lincoln & Sheals (1985) and Tikader (1987). The preserved specimens are currently in the collection of the Department of Zoology, Khulna Govt. Womens' College, Khulna -9000, Bangladesh [DOZ, KGWC].

All the necessary body-parts were dissected out and illustrated under Stereozoom binocular microscope. Epigynum and male palp were dissected and cleared in 10% KOH. Leg measurements are given in the following sequence: femur, patella, tibia, metatarsus, tarsus, and total length. All measurements are in millimetres (mm).

Identification references consulted are: Pocock (1900), Smithers (1945), Sinha (1951), Tikader & Biswas (1981), Song & Zheng (1982), Wang & Yin (1985), Baehr & Baehr (1987, 1993), Foord & Dippenaar-Schoeman (2006), and Jocqué & Dippenaar-Schoeman (2006).

Results

Taxonomy

Family **Hersiliidae** Thorell, 1870

Genus ***Hersilia*** Savigny, 1825
Type-species ***Hersilia caudata*** Savigny, 1825

Hersilia Savigny in Audouin (1825), *Descr. Egypte Arachn*. : 114.

Diagnosis: Spiders of the genus *Hersilia* are medium to large in size. Cephalothorax rounded or nearly rounded, flat, laterally angular. Clypeus very high. Ocular quad parallel sided. Metatarsi of 1st, 2nd, and 4th legs uniarticulate or biarticulate. Abdomen dark, rounded, dorsally decorated. Posterior spinnerets extremely long, tail-like, segmented.

Biological note: *Hersilia* spiders are very active and commonly found in the gardens and forests. They are good predators, with bodies often mimicking the surface of trees. They can move very quickly on the tree trunks, old walls or under stones. They usually do not make any web but sometimes they can make a scanty web with irregular threads.

Distribution: Tropical, Sub-tropical, and warm temperate zones of the world.

Hersilia savignyi Lucas, 1836
(Figs. 1a-h)

Hersilia savignyi Lucas, 1836, *Mag. Zool*., 6(8): 10.
Hersilia indica: Walckenaer, 1837: 372 (not *H. indica* Lucas, 1836 = *Murricia indica*).
Hersilia calcuttensis: Stoliczka, 1869, *J. Asiat. Soc. Bengal*, 38: 216.
Hersilia savignyi: Simon, 1885: 19; Simon, 1893: 414; Pocock, 1900: 241; Gravely, 1922: 1050; Sinha, 1951: 122; Tikader, 1977: 184; Tikader & Biswas, 1981: 47; Baehr & Baehr, 1993: 29; Foord & Dippenaar-Schoeman, 2006: 80.
Hersilia clathrata: Thorell, 1895: 56; Barrion & Litsinger, 1995: 411.
[All synonyms and references are listed in the World Spider Catalog (2019)].

Material examined: 10♀♀, 4♂♂, Bagerhat, 25.VIII.1993 & 12.III.1994, Coll. V. Biswas; 1♀, Dhaka, 4.III.1993, Coll. V. Biswas; 2♀♀, Jhenaidah, 19.IX.1992, Coll. V. Biswas; 1♀, Magura, 12.IV.1991, Coll. V. Biswas; 3♀♀, 1♂, Narayanganj, 5.IV.1993, Coll. V. Biswas; 1♀, Potuakhali, 14.X.1992, Coll. V. Biswas; 2♀, Rajshahi, 2.III.1992, Coll. V. Biswas; 1♀, 1♂, Tangail, 12.V.1993, Coll. V. Biswas.

At present all specimens are in the collection of the Department of Zoology, Khulna Govt. Womens' College and will be deposited in the Museum of the Department of Zoology, University of Dhaka, Dhaka-1000, Bangladesh.

Description of the female (Fig. 1a**):** Body medium in size; cephalothorax and legs grey; abdomen grey with whitish markings. Total body length 8.50. Carapace 2.50 long, 2.60 wide; abdomen 6.00 long and 3.70 wide.

Cephalothorax: Nearly rounded, longer than wide, medially wide, anteriorly narrowing forming a nearly pointed median protuberance; cephalic region faintly raised, with a median shaped, white markings. Eyes dissimilar; anterior medians larger; anterior row recurved, posterior row straight with 2 distantly placed eyes. Thoracic region broad, with a median longitudinal fovea and 2 lateral margins. Chelicerae black-brown, longer than wide, outer margins with three teeth (Fig. 1b). Maxillae brown, longer than wide, anteromedially wide and scopulate (Fig. 1c). Labium black-brown, wider than long, anteriorly narrowed and scopulate (Fig. 1c). Sternum blackish-brown, longer than wide, anteriorly wide, posteriorly narrowed, both anterior and posterior margins concave (Fig. 1d). Legs very long and slender with sharp spines; leg formula 1243 and their measurements (in mm) are shown in Table (1).

Table 1. Measurements of leg segments of *Hersilia savignyi* Lucas, 1836 (♀).

Leg	Femur	Patella	Tibia	Metatarsus	Tarsus	Total
I	6.00	1.00	5.00	4.00	1.00	17.00
II	6.00	1.00	4.50	4.00	1.00	16.50
III	2.50	0.30	1.50	1.80	0.80	6.90
IV	4.50	0.50	5.00	4.50	1.00	15.50

Abdomen: Broad, apple-shaped, medially wide, posteriorly narrowed, dorsum decorated; lateral spinnerets very long and segmented; clothed with spine-like hairs; epigynum and internal genitalia as in Figs. (1e-f).

Male little smaller than female, darker in colour. Total body length 6.00. Carapace 2.00 long, 2.00 wide; abdomen 4.00 long and 3.50 wide. Male palp curved as in Fig. (1h).

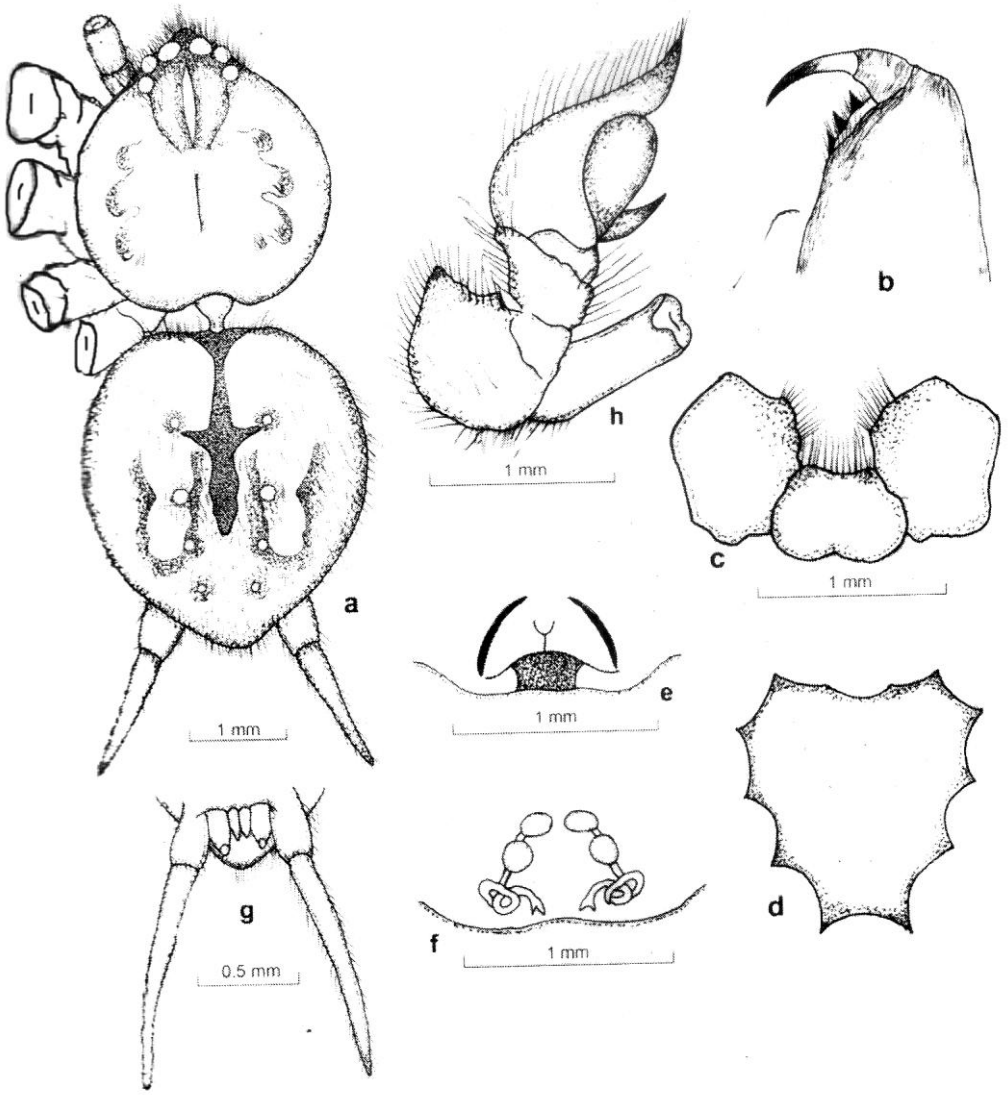

Fig. 1. *Hersilia savignyi* Lucas, 1836. a. Habitus, dorsal view. b. Chelicera, internal side. c. Maxillae and labium. d. Sternum. e. Female epigynum, ventral view. f. Female internal genitalia, dorsal view. g. Spinnerets, ventral view. h. Male palp, lateral view.

Distribution: Bangladesh: Bagerhat, Dhaka, Jhenaidah, Magura, Narayanganj, Potuakhali, Rajshahi, and Tangail; **Myanmar, India, Nepal, Sri Lanka, Philippines** (Tikader & Biswas, 1981; Baehr & Baehr, 1993; World Spider Catalog, 2019).

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A new species of the jumping spider genus *Harmochirus* Simon, 1885 from Bangladesh (Araneae: Salticidae)

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Abstract

The new jumping spider species, *Harmochirus tikaderi* sp. n. of the family Salticidae is described from Khulna, Bangladesh. Generic diagnosis and distribution are provided together with the description of the species.

Keywords: Araneae, Salticidae, *Harmochirus*, New species, Bangladesh.

Introduction

Spiders of the family Salticidae (jumping spiders) belong to a common, attractive and fascinating group of arachnids in the crop-fields, gardens and forests. These are cosmopolitan in distribution and at present contains 6109 described species under 636 genera in the world fauna (World Spider Catalog, 2019; Prószyński, 2016). Members of the genus *Harmochirus* Simon, 1885 are very common in the gardens and forests of Bangladesh. They don't make any web but can jump an unusual distance other than their body size during preying. Many of them usually stay on the leaves of shrubs in the day and serve as one of the important biological control agents of insect pests in the garden and forests.

The genus *Harmochirus* was first erected by Simon in 1885 with the type-species *Ballus brachiatus* Thorell, 1877 and at present, it is represented by 10 species worldwide (World Spider Catalog, 2019). In Asia, the genus was first reported by Thorell (1895) as *H. brachiatus* and till date many authors of India and other Asian countries reported different species of this genus in different times (Narayan, 1915; Tikader, 1976; Żabka, 1985; Yaginuma, 1986; Prószyński, 1990; Chen & Zhang, 1991; Peng *et al.*, 1993;

Barrion & Litsinger, 1995; Logunov *et al.*, 1997; Song *et al.*, 1999; Logunov, 2001; Xiao & Wang, 2005; Sen *et al*., 2015; Caleb & Mathai, 2015) but in Bangladesh, only two species are described (Okuma *et al*., 1993; Biswas, 2009, 2016).

The present paper contains the description of a new species *H. tikaderi* sp. n. from Khulna, Bangladesh. Generic diagnosis and distribution are provided together with the description of the species.

Bangladesh is rich in forest entomofauna in which jumping spiders covering a great part among all types of arachnids. Their numbers are increasing day by day with the continuous study of spiders and hope, in future, it will help in identification and conservation practices of endangered spiders of the country. Also, as these spiders play a great role in the biological control of forest insect pests, so, careful conservation of these natural enemies will help the future ecosystem management programme of the country.

Material and Methods

The study was initiated with the collection of specimens from different gardens of Khulna districts, the southern part of Bangladesh. After sorting, all the specimens were preserved primarily in 70% ethanol and after identification the specimens were finally preserved in Audmans' preservative (90 parts 70% ethanol + 5 parts glacial acetic acid + 5 parts glycerine) following Lincoln & Sheals (1979) and Tikader (1987). The preserved specimens are currently deposited in the collection of the Department of Zoology, Khulna Govt. Womens' College, Khulna -9000, Bangladesh [DOZ, KGWC].

All the necessary body-parts are dissected out and illustrated under stereozoom binocular microscope. Male palp is dissected and cleared in 10% KOH. Leg measurements are given as in the following sequence: femur, patella, tibia, metatarsus, tarsus and total length. All measurements are in millimetres.

Identification references consulted are: Tikader (1976), Żabka (1985), Yaginuma (1986), Davies & Żabka (1989), Chen & Zhang (1991), Okuma *et al.* (1993), Peng *et al.* (1993), Barrion & Litsinger (1995), Logunov *et al.* (1997), Xiao & Wang (2005), and Sen *et al.* (2015).

Results

Taxonomy

Family **Salticidae** Blackwall, 1841

Genus ***Harmochirus*** Simon, 1885
Type-species ***Harmochirus brachiatus*** (Thorell, 1887)
Harmochirus Simon (1885), *Bull. Soc. zool. Fr*., 10: 440.

Diagnosis: Spiders of the genus *Harmochirus* are very small to small, dark-brown, with nearly rounded abdomen, clothed with hairs and spines. Cephalothorax on the level of eye III (PLE) broad. Eyes usually brown or pearly-white in some parts, highly elevated; anterior median eyes 3 times larger than anterior laterals, ringed with black band; posterior lateral eyes situated nearer or on the lateral margin of carapace. Chelicerae brown, strong, with few teeth (1-3) on the margin. Maxillae and labium brown, elongate or pot-like, both scopulate anteriorly. Legs usually short; leg I much elongated with tibial segment swollen or wide, with long, feathery bristle; metatarsi and tarsi clothed with brown, strong spines. Abdomen broad, rounded or oval, clothed with hairs and spines; male with more distinct scutum; lateral spinnerets something elongate.

Biological note: Spiders of this genus are usually found among the grasses and leaves of shrubs in the gardens and forests. They do not spin any web but during the breeding season, females can make typical nests on the leaves or loose barks of trees in which they lay eggs and stay there for nursing of the newly hatched spiderlings. Adult members scatteredly wander on the plant leaves searching for preys and catching them by jumping immediately after getting them. They are one of the important bio-control agents of insect pests in the gardens and forests.
Distribution: Africa and Asia.

Harmochirus tikaderi sp. n.
(Figs. 1, 2)

Material examined: Holotype: 1 male. Paratype: 1 male; both collected from the same locality.
Type-locality: BANGLADESH: Khulna, 19.IV.1992, Coll. V. Biswas; Bagerhat (near Khulna), 02.III.1992, Coll. V. Biswas. Deposited at present in the collection of the Department of Zoology, Khulna Govt. Womens' College and will be deposited in the Museum of the Department of Zoology, University of Dhaka, Bangladesh.

Description of the male (Figs. 1a, 2): Body very small. Cephalothorax black, legs brown and abdomen dark brown. Total body length 5.10. Carapace 2.10 long, 1.80 wide. Abdomen 3.00 long and 1.90 wide.
Cephalothorax: Carapace dark blackish brown, broad, greatly elongate, rectangular, nearly parallel sided, longer than wide, anteriorly broad and posteriorly narrowing, clothed with brown spines and pubescence. Eyes pearly white, dissimilar; anterior row of eyes faintly recurved; anterior medians nearly 4 times larger than the anterior laterals; 2nd row of eyes brown, minute, placed little far from the anterior row; posterior row of eyes large, straight, placed marginally; ocular trapezium square (Fig. 1a). Chelicerae brown, broad basally, strong, each of inner and outer margins with 1 tooth (Fig. 1c). Maxillae brown, petal-like, longer than wide, scopulate anteriorly (Fig. 1d). Labium brown, broad, astray-shaped, scopulate anteriorly (Fig. 1d). Sternum brown, anteromedially wide, posteriorly pointed, hairy (Fig. 1e). Legs short and strong; leg I enlarged, robust, tibiae and metatarsi with a series of linearly arranged strong spines (Fig. 1f); leg formula 1432 and the measurements (in mm) as in Table (1). Male palp as in Figs. (1g-h).

Table 1. Measurements of leg segments of *Harmochirus tikaderi* sp. n. (♂).

Leg	Femur	Patella	Tibia	Metatarsus	Tarsus	Total
I	1.50	0.30	1.20	1.00	0.90	4.90
II	0.90	0.20	0.70	0.60	0.50	2.90
III	1.00	0.25	0.95	0.80	0.60	3.60
IV	1.50	0.30	1.10	0.90	0.80	4.60

Abdomen: Rounded, nearly ball-like, clothed with fine hairs, spines and pubescence; ventrally pale yellow with dense hairs; spinnerets (Fig. 1b).
Female: unknown.
Etymology: The species is named after the famous Indian Arachnologist Dr. B.K. Tikader.

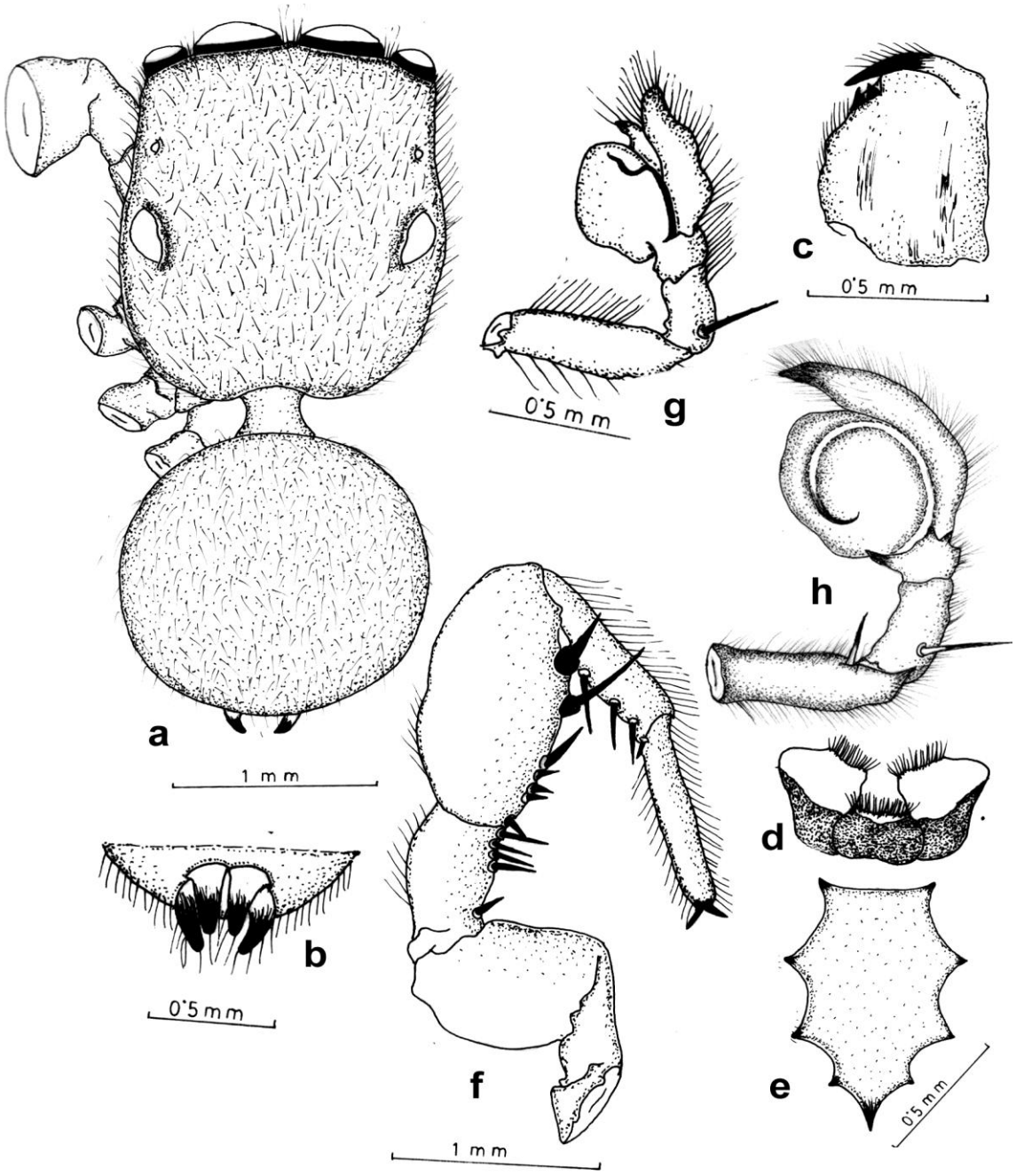

Fig. 1. *Harmochirus tikaderi* n. sp. ♂. a. Habitus, dorsal view. b. Spinnerets, ventral side of abdomen's tip. c. Chelicera. d. Maxillae and labium. e. Sternum. f. First leg showing spination. g-h. Male palp. g. lateral view. h. ventral view.

Remarks : Known *Harmochirus* species (Tikader, 1976; Żabka, 1985; Yaginuma, 1986; Davies & Żabka, 1989; Okuma *et al.*, 1993; Barrion & Litsinger, 1995; Logunov *et al.*, 1997; Xiao & Wang, 2005; Sen *et al.*, 2015; Biswas, 2016) do not show similarity with the present species. Also, structure of the male palp of the present species is totally different from the known described ones. Therefore, the present species is described as new to science.

Fig. 2. *Harmochirus tikaderi* n. sp. ♂. Whole body, dorsal view.

Acknowledgments

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First description of the male of *Uloborus jabalpurensis* Bhandari & Gajbe, 2001 (Araneae: Uloboridae)

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Abstract

The genus *Uloborus* Latreille, 1806 includes 80 species and subspecies worldwide, out of these, nine species were reported from India. The male of *Uloborus jabalpurensis* Bhandari & Gajbe, 2001, among these nine species, is described and illustrated in detail with its distribution map.

Keywords: Spiders, Uloboridae, *Uloborus jabalpurensis*, India.

Introduction

Triangle-web spiders are belonging to the family Uloboridae Thorell, 1869 which includes 286 species under 19 genera worldwide (World Spider Catalog, 2019), of which 22 species under 5 genera are known from India (Chatterjee *et al.*, 2018) and 9 of them belong to genus *Uloborus* Latreille, 1806 which includes 80 species and subspecies worldwide. During the study of the spider diversity of North Maharashtra region, we recognized an uloborid female spider belonging to genus *Uloborus* with her male. The species was identified as *Uloborus jabalpurensis* Bhandari & Gajbe, 2001. The male of this species is unknown. The objective of the present study is to provide the detailed description of the male for the first time with morphometry of eyes and legs of both sexes.

Material and Methods

Spiders were handpicked from various places in and around Jalgaon city, Maharashtra, India after the permission granted from Maharashtra State Biodiversity Board, Nagpur. Live spiders were photographed using DSLR Nikon D3100, 18-55 mm lens. The spider species were identified by using the key described by Bhandari & Gajbe (2001). Spiders were preserved in 70% ethyl alcohol for further taxonomical examination in the Department of Zoology, Moolji Jaitha College, Jalgaon. The taxonomical examination was performed under a Lawrence and Mayo compound microscope LM-52-1800 and stereo zoom microscope LM-52-3624. Male palpal organ and female epigyne were cleared using 10% KOH solution. The cleared epigyne and palpal organ were observed and photographed using compound microscope attached to Nikon D3100 with 2X microscope adapter. Micro-measure software was used to make measurements. Morphological descriptions were made based on freshly collected specimens. The specimens will be deposited at the National Zoological Collections Zoological Survey of India (ZSI), Western Regional Centre, Pune. All measurements are given in millimetres (mm). Leg measurements are given as length of femur, patella, tibia, metatarsus, tarsus and total length.

Abbreviations used: ALE = anterior lateral eye, AME = anterior median eye, PLE = posterior lateral eye, PME = posterior median eye. AME-AME = inter distance between eyes.

Taxonomy

Family **Uloboridae** Thorell, 1869

Genus ***Uloborus*** Latreille, 1806

Uloborus jabalpurensis Bhandari & Gajbe, 2001

Description

Female (Figs. 1-4, 11)

Cephalothorax, legs, abdomen and spinnerets are dirty white in colour (Fig. 11). Total length 4.75; carapace 1.5 long and 1.49 wide; abdomen 3.25 long and 1.89 wide. The morphometry of legs is shown in Table (1). Eye measurements are: AME 0.07, ALE 0.06, PME 0.08, PLE 0.05, AME-AME 0.26, PME-PME 0.12, PLE-PLE 0.60, AME-ALE 0.09, ALE-PME 0.30, PME-PLE 0.15.

Abdomen is longer than wide, high and broad in front, clothed densely with fine hairs (Fig. 11) and decorated with fine net pattern (Fig. 1). Hump is present at anterior dorsal side also conspicuous blackish marking at mid-dorsal region and six tufts of white hairs on posterior region in two rows (Fig. 11). Epigyne as in Figs. (3-4).

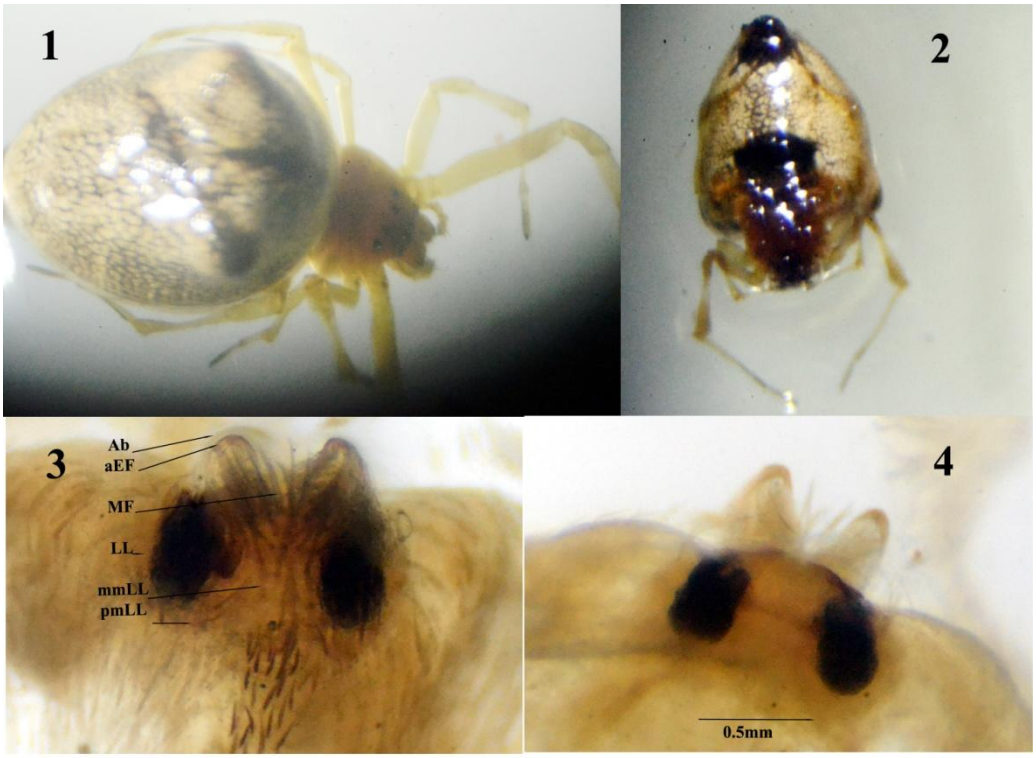
Table 1. Measurements of leg segments of *Uloborus jabalpurensis* Bhandari & Gajbe, 2001 (♀).

Leg	Femur	Patella	Tibia	Metatarsus	Tarsus	Total
I	2.40	0.49	1.46	1.32	1.15	6.82
II	1.27	0.43	0.70	1.08	0.55	4.03
III	1.05	0.43	0.52	0.73	0.54	3.27
IV	1.52	0.48	1.11	1.19	0.77	5.07

Male (Figs. 5-10, 12)

Cephalothorax, abdomen and spinnerets are dirty white in colour while metatarsus and tarsus of legs are red brown in colour (Fig. 12). Total length 3.48; carapace 0.91 long and

0.8 wide; abdomen 2.57 long and 1.34 wide. The morphometry of legs is shown in Table (2). Eye measurements are: AME 0.09, ALE 0.05, PME 0.09, PLE 0.08, AME-AME 0.10, PME-PME 0.18, PLE-PLE 0.53, AME-ALE 0.07, ALE-PME 0.15, PME-PLE 0.05. Abdomen is decorated with fine net pattern as same as in female. The male palp can be recognized by the thin, circular coiled embolus and median apophysis bulb with median apophysis spur present anteriorly (Figs. 7-10).



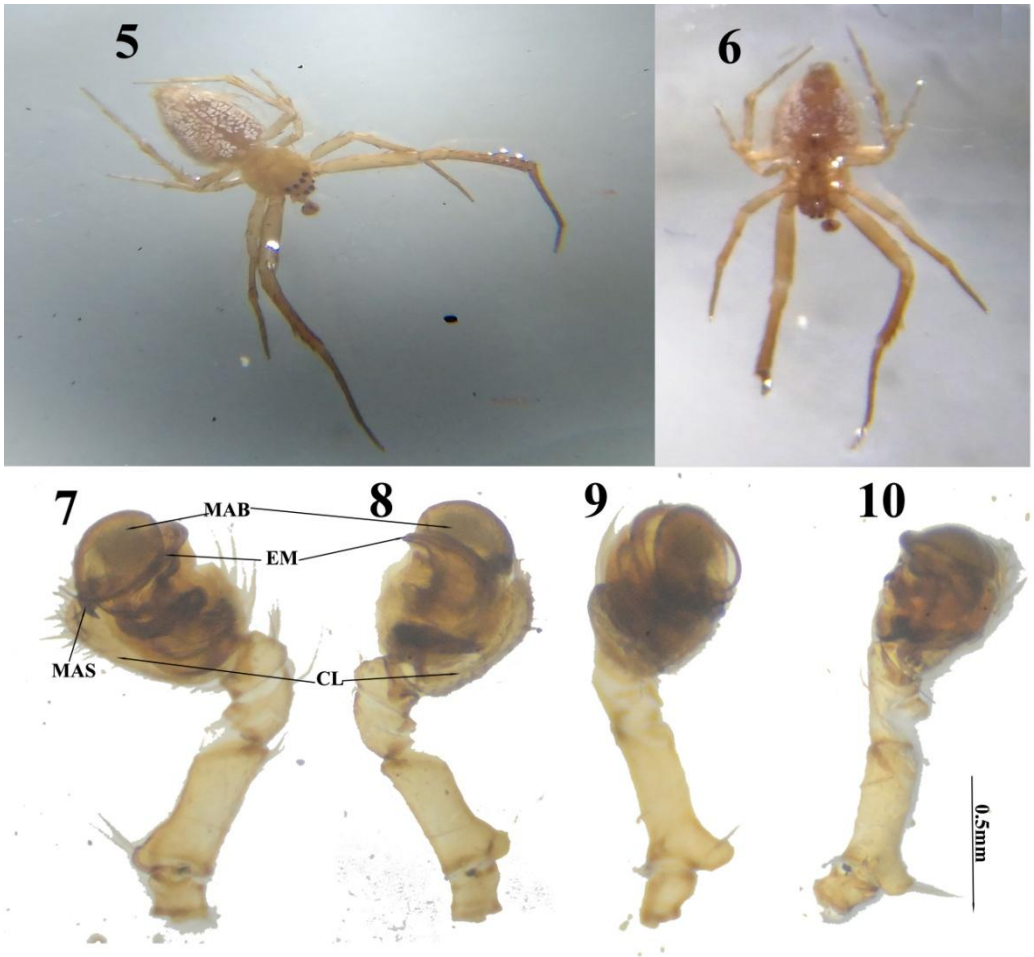
Figs. 1-4. *Uloborus jabalpurensis* Bhandari & Gajbe, 2001 ♀. 1-2. Habitus. 1. dorsal view. 2. ventral view. 3-4. Epigyne. 3. ventral view. 4. dorsal view. Abbreviations: Ab = anterior bands; aEF = margin of epigynal field; LL = lateral lobes of epigyne; MF = median field of epigyne; mmLL = median margin of lateral lobes; pmLL = posterior margins of lateral lobes.

Table 2. Measurements of leg segments of *Uloborus jabalpurensis* Bhandari & Gajbe, 2001 (♂).

Leg	Femur	Patella	Tibia	Metatarsus	Tarsus	Total
I	1.69	0.36	1.38	1.33	0.65	5.41
II	0.85	0.34	0.70	0.83	0.49	3.21
III	0.67	0.30	0.43	0.55	0.44	2.39
IV	1.10	0.48	0.81	0.85	0.60	3.84

Natural History

Uloborus species are common in and around the Jalgaon city, Maharashtra, India (Fig. 13). Both male and female are active predators throughout the day. They are found commonly near the residential and agricultural areas. What is significant to note is that several species are reported in various parts of India. However, first record of female of this species was recorded from Jabalpur M.P., whereas male is first time described from North Maharashtra region. This represents their distribution across the country.



Figs. 5-10. *Uloborus jabalpurensis* Bhandari & Gajbe, 2001 ♂. 5-6. Habitus. 5. dorsal view. 6. ventral view. 7-10. left palp. 7. prolateral view. 8. retrolateral view. 9. ventral view. 10. dorsal view. Abbreviations: CL = cymbium; EM = embolus; MAB = median apophysis bulb; MAS = median apophysis spur.

Figs. 11-12. *Uloborus jabalpurensis* Bhandari & Gajbe, 2001 alive spiders. 11. Female. 12. Male.

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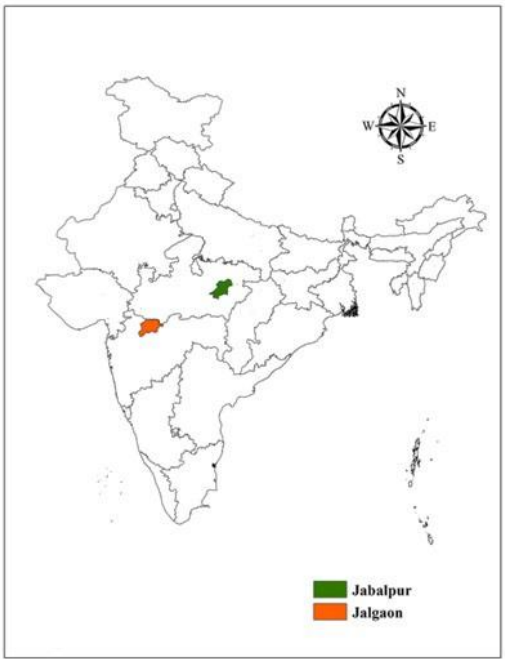

Fig. 13. Distribution map of *Uloborus jabalpurensis* Bhandari & Gajbe, 2001 in India. Jabalpur: record from literature. Jalgaon: new locality record.

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First record of *Hersilia scrupulosa* Foord & Dippenaar-Schoeman, 2006 (Araneae: Hersiliidae) from Asia

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Abstract

Hersilia scrupulosa Foord & Dippenaar-Schoeman, 2006 is recorded for the first time from Asia. Both male and female are here described based on specimens collected from India. *H. scrupulosa* is closely related to some other species but differentiated by the presence of crenulae on tegulum of male palp and riffles in epigynal plate.

Keywords: Araneae, Hersiliidae, *Hersilia scrupulosa*, new record, Kalaburagi, India, Asia.

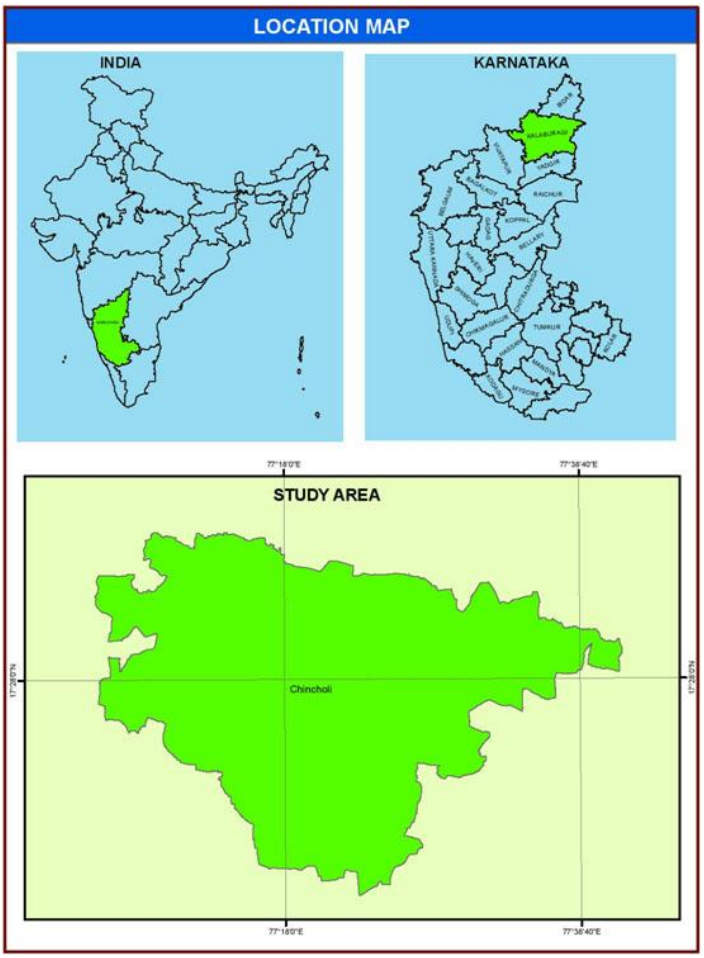
Introduction

Hersiliidae Thorell, 1870 are entelegyne spiders including 16 genera and 182 species worldwide. In India 3 genera are represented: *Hersilia* Savigny, 1825 [6 species], *Murricia* Simon, 1882 [3 species], and *Neotoma* Baehr & Baehr, 1993 [2 species] (World Spider Catalog, 2019). According to Baehr & Baehr (1993) hersiliids are placed in different genera by considering the account of metatarsus I, II and IV, size and number of the dorsal muscular pit, distance between AME and PME, and receptaculum seminis development.

Hersilia is the largest genus in this family distributed in Afrotropical, Indo-Malayan, and Palaearctic regions. Within *Hersilia*, species are differentiated by considering the characters such as tibia and patella of pedipalp, embolus and tegular apophysis, cymbial spines for male and median scapus, vulvae, receptaculum seminis and length of posterior lateral spinnerets for female. The genera *Hersilia* and *Murricia* are

closely related by means of biarticulate metatarsus and presence of only 4 dorsal muscular pits [DMP] (Baehr & Baehr, 1993).

In the present paper we report *Hersilia scrupulosa* Foord & Dippenaar-Schoeman, 2006 as a new record for the fauna of India. We have described both male and female which were found in Chincholi wildlife sanctuary, Kalaburagi, Karnataka (Map 1) that is only dry land sanctuary in south India.



Map 1. Map of Chincholi taluk District, Kalaburgi, Karnataka, India where specimens have been collected.

Material and Methods

All collected specimens of this species were preserved in 70% ethanol and male and female genitalia were dissected out using a fine surgical scalpel and then cleared in 10% KOH aqueous solution. The basic identification of specimens was made by a Carl-Zeiss Stemi 2000-c Stereo-Zoom microscope and photographed by Axio Cam ERc5s camera and Olympus SZ61 Stereo-Zoom microscope mounted with Slides UV SLI500. All measurements are in millimetres; measurements of leg segments are given in the following sequence: femur, patella, tibia, metatarsus, and tarsus.

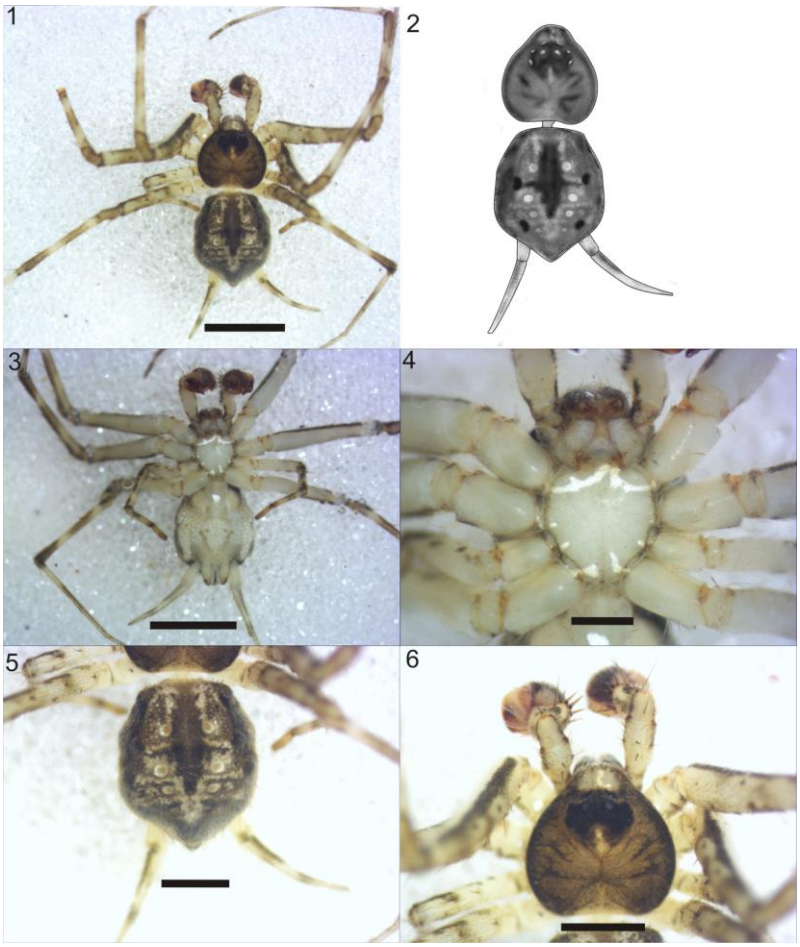
Abbreviations used in the text: ALE = anterior lateral eye, AME = anterior median eye, PLE = posterior lateral eye, PME = posterior median eye; Leg spination: d = dorsal, dt = dorsal terminal, l = lateral, p = prolatral, r = retrolatral, v = ventral, vt = ventral terminal, L = length, W = width.

Results

Hersilia scrupulosa Foord & Dippenaar-Schoeman, 2006
Type locality: Kenya coast, Taita Discovery Center, Kenya.

Material examined: 1♂, from Konchavaram wildlife Sanctuary, Kalaburagi, India, 2♀♀ from government college, Kalaburagi, and 1♀ from Konchavaram wildlife Sanctuary, Kalaburagi, India, collected in December 2016 by Dr. Shashikanth H. Majagi and Supriya T.

Male (Figs. 1-11, Tables 1-2)
Description: Body 6.01 L; Carapace 1.82 L, 1.75 W. Carapace is red brown with black boarder, and slightly longer than wide. Elevated anterior region convex between posterior median eyes and concave behind posterior eye row. Lateral eyes are located on tubercles. ALE are pearly white. Both eye rows are recurved. Diameters of eyes: AME 0.17, PME 0.16, PLE 0.13, ALE 0.09. Chelicerae with three promarginal and nine retromarginal teeth. Third leg smallest, nearly ½ the size of rest legs, with stout segments. Leg formula 2143. Patellae pale brown, tarsi dark brown and tibiae distally dark brown. Abdomen 6.01 L (including spinnerets), 2.50 L, 2.11 W, with two humps on lateral sides and four pairs of dorsal muscular sigillae. Abdomen also has a lancet shaped cardiac impression extends up to third pair of dorsal muscular pits. Spinnerets slightly shorter than abdomen.



Figs. 1-6. *Hersilia scrupulosa*, ♂. 1-2. Habitus, dorsal view. 3. Habitus, ventral view. 4. Sternum. 5. Abdomen, dorsal view. 6. Cephalothorax, dorsal view.
Scale bars: 2 mm (1 & 3), 1 mm (4 & 5), 0.5 mm (6).

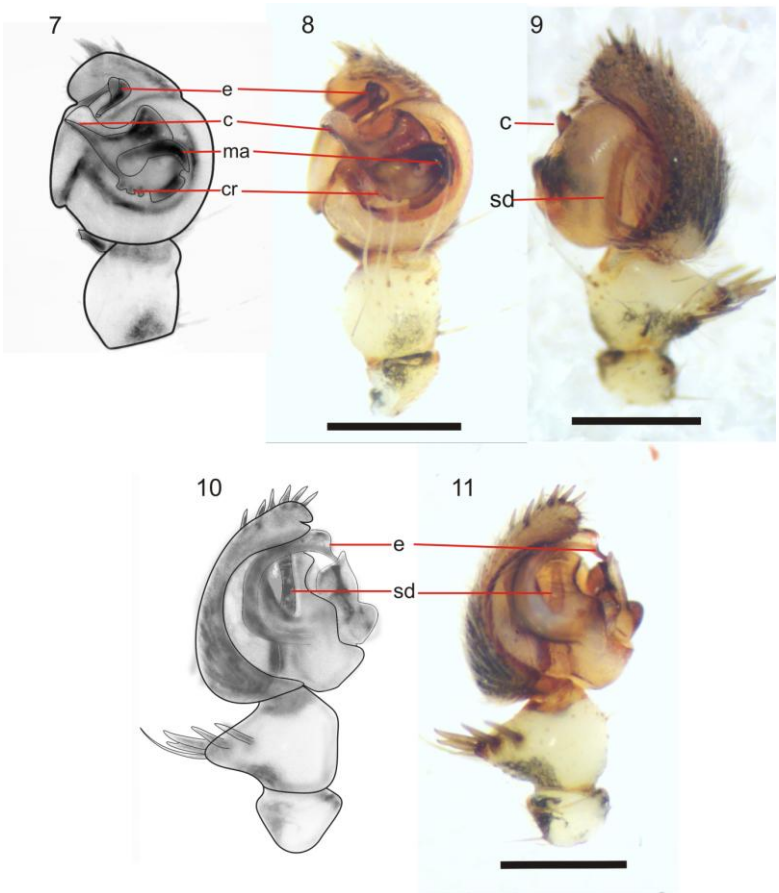
Pedipalp: palpal tibia short and wide with 5 spines. Short cymbium markedly pilose on anterior dorsal region, with 5 spines at the tip, embolus is sickle-shaped arising from centre of the bulbs, runs along with cymbium margin clockwise direction up to apical then further it forwards as twisted to anti-clock direction. Tip of the embolus lies between lightly sclerotized conductor. Median apophysis is arising from another end of the tegulum which is heavily sclerotized. Retrolateral median apophasis consists of three crenulae.

Table 1. Measurements of leg segments of *Hersilia scrupulosa* (♂).

Leg	Femur	Patella	Tibia	Metatarsus	Tarsus	Total
I	3.36	0.59	2.10	4.78	0.69	11.52
II	3.21	0.57	3.00	4.62	0.67	12.07
III	1.36	0.32	0.87	1.08	0.54	4.17
IV	2.97	0.55	2.62	4.26	0.59	10.99

Table 2. Male leg spination**.**

Leg	Femur	Patella	Tibia	Metatarsus
I	d4, p4, r1	d2, p2, rl1	d2, r2, p2	d1, p2, r2
II	d3, p4, r4	d2, p1, rl1	d1, p2, r3	d1, p2, r2
III	d2, r2	d2, r1	---	---
IV	d3, r2	d2, r1	d1, p3, r2	d1, p2, r2



Figs. 7-11. *Hersilia scrupulosa*, ♂ palpal organ. 7-8. ventral view. 9. prolatral view. 10-11. retrolatral view. Scale bars: 0.5 mm (8, 9 &11).
[e = embolus, c = conductor, ma = median apophysis, cr = crenulae, sd = sperm duct]

Female (Figs. 12-21, Tables 3-4)

Description: Body 10.05 L; Carapace 2.43 L, 2.36 W; Abdomen 7.17 L (including spinnerets), 3. 81 L, 3. 72 W. Diameters of eyes: PLE 0.18, ALE 0.14, AME 0.21, PME 0.18; AME-AME 0.21, PME-PME 1.88, AME-ALE 0.09, PME-PLE 0.20. Palp: femur 1.08, patella 0.42, tibia 0.57, metatarsus 0.46, tarsus 0.67. Description of female is the same as male but differs in having a body larger in size and prominently darker in colour. Epigyne: externally sclerotized median plates and lateral boarders together form inverted U-shape. Spermathecae elongated, a copulatory duct is twice as a length of spermathecae. Fertilization duct is almost equal to a length of spermathecae. Riffles can be evidently seen from ventral epigyne only in fresh sections.

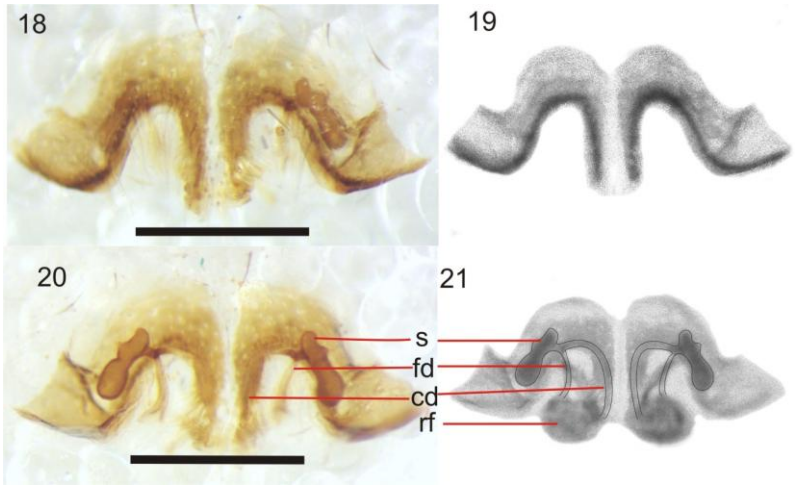
Figs. 12-17. *Hersilia scrupulosa*, ♀. 12. Habitus, dorsal view. 13. Habitus, ventral view. 14. Cephalothorax, dorsal view. 15. Abdomen, dorsal view. 16. Sternum. 17. Epigyne, ventral view. Scale bars: 1 mm.

Table 3. Measurements of leg segments of *Hersilia scrupulosa* (♀).

Leg	Femur	Patella	Tibia	Metatarsus	Tarsus	Total
I	4.18	0.68	3.66	5.18	0.61	14.31
II	4.20	0.74	3.60	5.23	0.81	14.58
III	1.72	0.48	1.19	1.32	0.70	5.41
IV	3.62	0.68	3.14	4.83	0.71	12.98

Table 4. Female leg spination**.**

Leg	Femur	Patella	Tibia	Metatarsus
I	d6, p3, r2	d2, p1, r1.	d2, r2, p2	d2, p4, r1
II	d6, p3, r1	d2, p1, r1.	d2, p2, r3	d2, p4, rl1
III	d2, p1, r1.	d2, p1.	d3, v1	d2, p1, r1, vt3,vr1, vp1
IV	d4, p2, r2.	d2, r1.	d3, p1, r2	d2, p3, r1, v6.



Figs. 18-21. *Hersilia scrupulosa*, ♀. 18-19. Epigyne, ventral view. 20-21. Epigyne and vulvae, dorsal view. Scale bars: 0.5 mm (18 & 20).
[s = spermatheca, fd = fertilization duct, cd = copulatory duct, rf = riffle]

Remarks: *H. scrupulosa* is closely related to *H. incompta* Benoit, 1971 of Ivory Coast but it is differentiated by the presence of crenulae on tegulum of male palp and riffles in female epigynal plate (Foord & Dippenaar-Schoeman, 2006). *Hersilia orvakalensis* Javed, Foord & Tampal, 2010 which was described from India is almost similar in structure of epigyne and palp but differs in absence of crenulae on retrolatateral boarder of median apophasis and origin of embolus in palp and riffle pad in epigyne (Javed *et al.*, 2010). However, *Hersilia talebii* Mirshamsi, Zamani & Marusik, 2016 of Iran also shows similarity in epigynal structure but differs in accessory gland and its male is not yet known (Mirshamsi *et al.*, 2016). By considering all these literature authors confirmed the species which we are describing is *H. scrupulosa*.

Ecology: A Chincholli wildlife sanctuary is a dry deciduous area that covers 14,958 hectares and is the only dry land wildlife sanctuary in South India. We collected these specimens from tree bark of *Albizia lebbeck* (L.) Benth (commonly Siris tree), where direct sunlight is quite difficult. They are arboreal and fast runners. They leave single web line on barks, most of the time that is the indicator for *Hersilia*. As per world spider catalog, till date no *Hersilia scrupulosa* is recorded from Asia (World Spider Catalog, 2019). So our study reports this soecies as a new record from Asia, implying the description of specimens available from India.

Discussion

H. scrupulosa was recorded previously only from Kenya. It is a surprise that except *H. caudata* Savigny, 1825 (West Africa to China) this species is common in both aftrotropical region and oriental region. According to Baehr & Baehr (1993) most species

are arboricolous, the dispersal ability of Hersiliidae spiders are good. Paradoxically this may be the reason of distribution of this species both in Kenya and India. If this species is distributed in India, it may distribute in surrounding countries and different regions within our country too. This perhaps require extensive field study.

Acknowledgments

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Occurrence of *Archaraeoncus prospiciens* (Thorell, 1875) (Araneae: Linyphiidae) in Turkey

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Abstract

In this paper, *Archaraeoncus prospiciens* (Thorell, 1875) and genus *Archaraeoncus* Tanasevitch, 1987 of family Linyphiidae are recorded from Turkey for the first time. In addition, characteristic features and photographs of *Archaraeoncus prospiciens* (Thorell, 1875) are presented.

Keywords: Araneae, Linyphiidae, *Archaraeoncus prospiciens*, new record, Turkey.

Introduction

Genus *Archaraeoncus* Tanasevitch, 1987 includes only 4 species, mainly recorded from Palaearctic region. Two male specimens of *Archaraeoncus prospiciens* (Thorell, 1875) were found in Adıyaman, Turkey. In this study, *A. prospiciens* is recorded from Turkey for the first time. This new record increases the known Turkish linyphiid fauna to more than 130 species (Demir & Seyyar, 2017; Danışman *et al.*, 2019).

Material and Methods

Two male specimens were examined from South-eastern Anatolia Region of Turkey. Specimens were collected during the day by hand aspirator from under stones. Pictures were taken using a Leica S8APO microscope by means of a Leica DC 160 camera. Used dish with paraffin on the bottom had different size holes made in the paraffin to keep specimen in the right position. All measurements are in millimetres. SEM

microphotograph were made with JEOL JSM-5600 in the University of Kırıkkale. Specimens were deposited in the collection of Arachnological Museum of Kırıkkale University (KUAM), preserved in 70% ethanol. Identification of species depended on Tanasevitch (1987, 2008).

Results

Genus ***Archaraeoncus*** Tanasevitch, 1987

Archaraeoncus prospiciens (Thorell, 1875)
Material examined: 2♂♂, Adıyaman Province, Samsat District (37°34'54.9"N, 38°28'49.6"E), 04.05.2019.
Description of male: Total length 1.65. Prosoma 0.8 long, 0.55 wide. Abdomen 0.85 long, 0.6 wide. Prosoma light brown, its front part is slightly in the front up position. Sternum is gray. Labium and maxillae are light brown. The dorsal and ventral sides of the abdomen are gray (Figs. 1-2). Legs light yellow. Palpal retrolateral tibial apophysis falcate shaped, distal suprategular apophysis well-developed (Fig. 3).
Distribution: Bulgaria, Ukraine, Russia (Urals), Azerbaijan, China (World Spider Catalog, 2019).

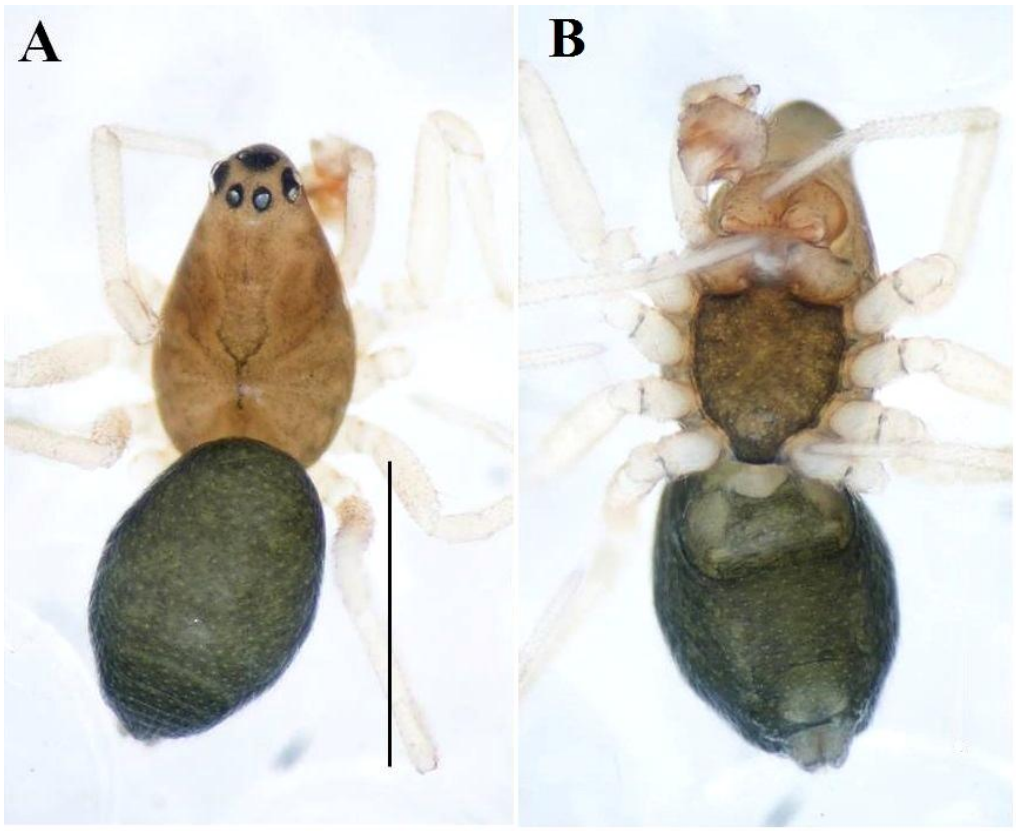

Fig. 1. *Archaraeoncus prospiciens* (Thorell, 1875) ♂, habitus. A. dorsal view. B. ventral view. Scale: 1 mm.

Fig. 2. *Archaraeoncus prospiciens* (Thorell, 1875) ♂, lateral view. Scale: 1 mm.

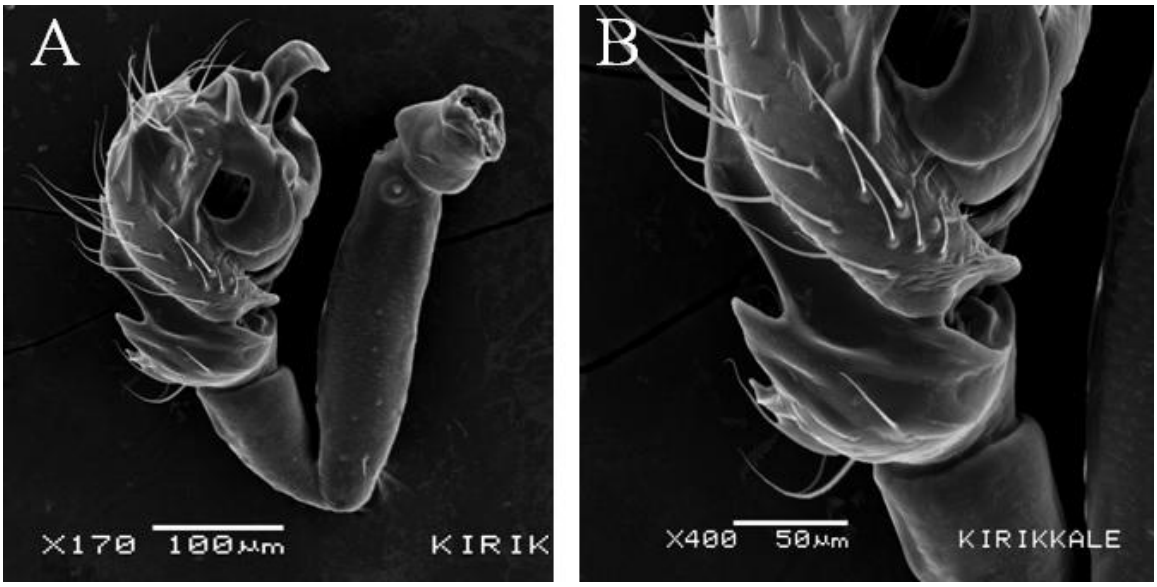

Fig. 3. *Archaraeoncus prospiciens* (Thorell, 1875) ♂. A. pedipalp. B. tibial apophysis, retrolateral view, SEM micrographs.

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Serket (2019) vol. 17(1): 42-44.

Lasophorus Chatzaki, 2018 and *Lasophorus zografae* Chatzaki, 2018 (Araneae: Gnaphosidae) are new records for Turkish spider fauna

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Abstract

The gnaphosid spider species, *Lasophorus zografae* Chatzaki, 2018 and its genus *Lasophorus* Chatzaki, 2018 are recorded for the first time from Turkey. Its general habitus and genitalia are illustrated. The collecting data of this species are also given.

Keywords: Araneae, Gnaphosidae, *Lasophorus zografae*, new record, Turkey.

Introduction

Ground spiders Gnaphosidae is one of the big spider groups that contains 2534 worldwide species from 158 genera (World Spider Catalog, 2019). This family is now the largest spider family in Turkey containing more than 145 species and 30 genera (Demir & Seyyar, 2017). Genus *Lasophorus* was established by Chatzaki (2018) as a new zelotine genus from Greece. It is a small genus of only two species (Chatzaki, 2018). We have found a member of this genus in Meydan Plateau (İbrişim village) in Aladağ district. The aim of this paper is to present the gnaphosid spider taxa *Lasophorus* Chatzaki, 2018 and *Lasophorus zografae* Chatzaki, 2018 as new records for the Turkish araneofauna.

Material and Methods

In this study, only male specimens were collected from Meydan Plateau area (Ibrişim village) in Aladağ district in the Mediterranean region of Turkey. Examined specimens were preserved in 70% ethanol and deposited in the NOHUAM. In the

identification, Chatzaki (2018) was consulted. The identification was made by means of a SZX61 Olympus stereomicroscope.

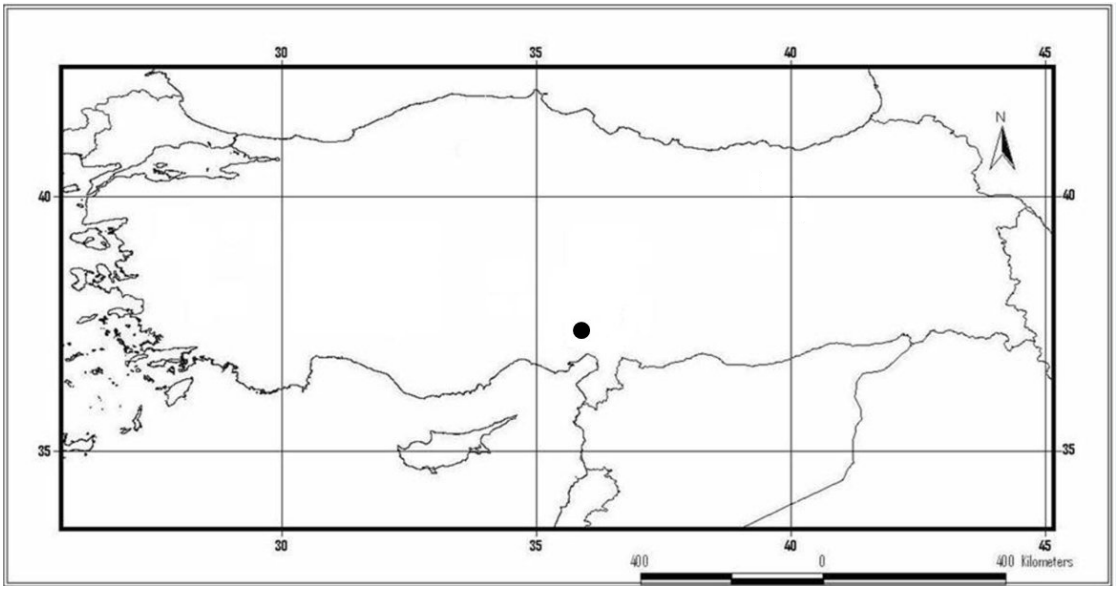

Fig. 1. Map of Turkey showing collecting locality: Meydan Plateau area in Aladağ District (Adana Province) in Anatolia.

Result

Lasophorus zografae Chatzaki, 2018

Collected specimens: 2♂♂, Adana Province: İbrişim village (37°31'87"N, 35°19'33"E), alt. 896 m, 16.VI.2017, leg. Hakan Demir.

Fig. 2. General habitus of *Lasophorus zografae* Chatzaki, 2018 ♂, dorsal view, from Meydan Plateau area, Adana Province.

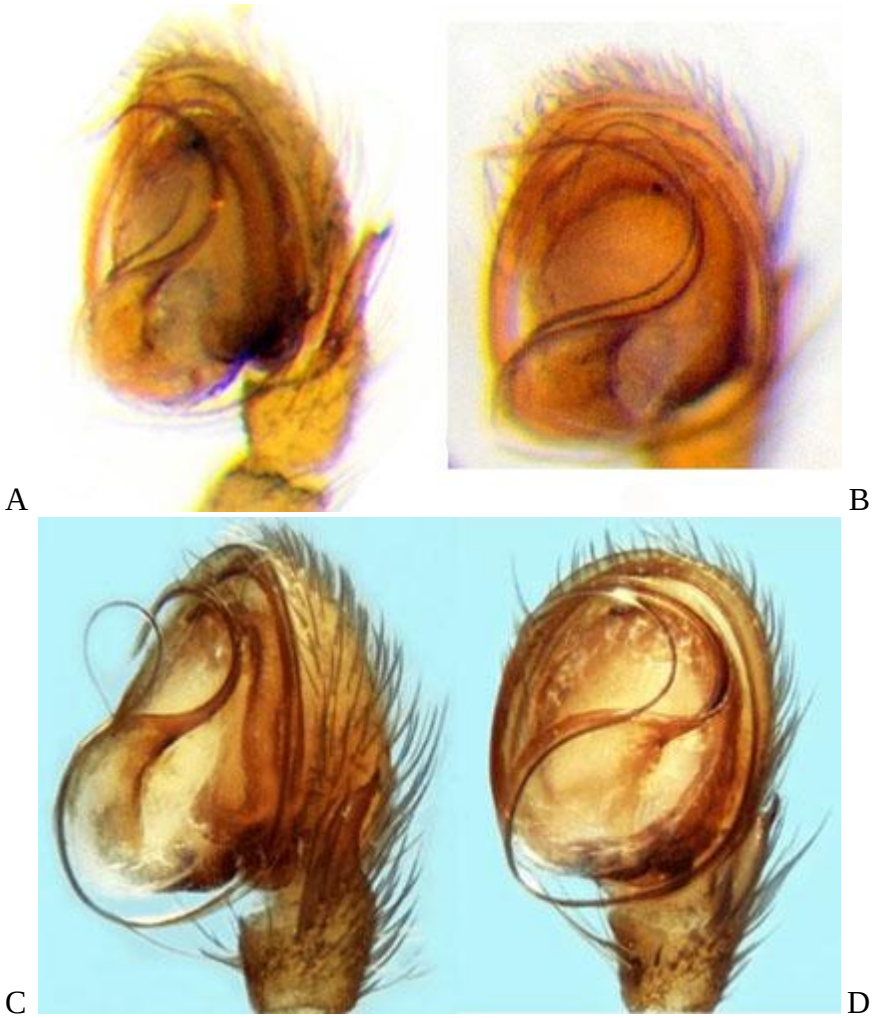

Fig. 3. *Lasophorus zografae* Chatzaki, 2018 ♂, palp. A, C. retrolaretal view. B, D. ventral view. A-B. from Meydan Plateau area, Adana Province. C-D. from Greece, after Chatzaki (2018) for comparison.

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Kishidaia conspicua (L. Koch, 1866) (Araneae: Gnaphosidae) is a new record for Turkish spider fauna

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Abstract

The gnaphosid spider species, *Kishidaia conspicua* (L. Koch, 1866) is recorded for the first time from Turkey. Its general habitus and genitalia are illustrated. Description and collecting data of this species are also given. Also, genus *Kishidaia* Yaginuma, 1960 is recorded for the first time from Turkey.

Keywords: Araneae, Gnaphosidae, *Kishidaia conspicua*, new record, Turkey.

Introduction

Gnaphosidae is one of the biggest spider groups, which contains worldwide 2534 species from 158 genera (World Spider Catalog, 2019) and 147 species and 32 genera in Turkey (Demir & Seyyar, 2017; Seyyar *et al.*, 2019). The members of *Kishidaia* Yaginuma, 1960 are similar to *Poecilochroa* species. Kamura (2001) transferred *P. conspicua* to genus *Kishidaia*. The female of this species can be easily distinguished by its receptacula seminis in epigyne. We could find members of this species in Kelkit Valley in Black Sea Region of Turkey. The aim of this paper is to present the gnaphosid spider taxa *Kishidaia* Yaginuma, 1960 and *Kishidaia conspicua* (L. Koch, 1866) as new records for the Turkish araneofauna.

Material and Methods

In this study, two female specimens were collected from Kelkit Valley in Black Sea Region of Turkey (Fig. 1). Examined specimens were preserved in 70% ethanol and

deposited in the NOHUAM. For the identification, Murphy (2007) was consulted. The identification was made by means of a SZX61 Olympus stereomicroscope.

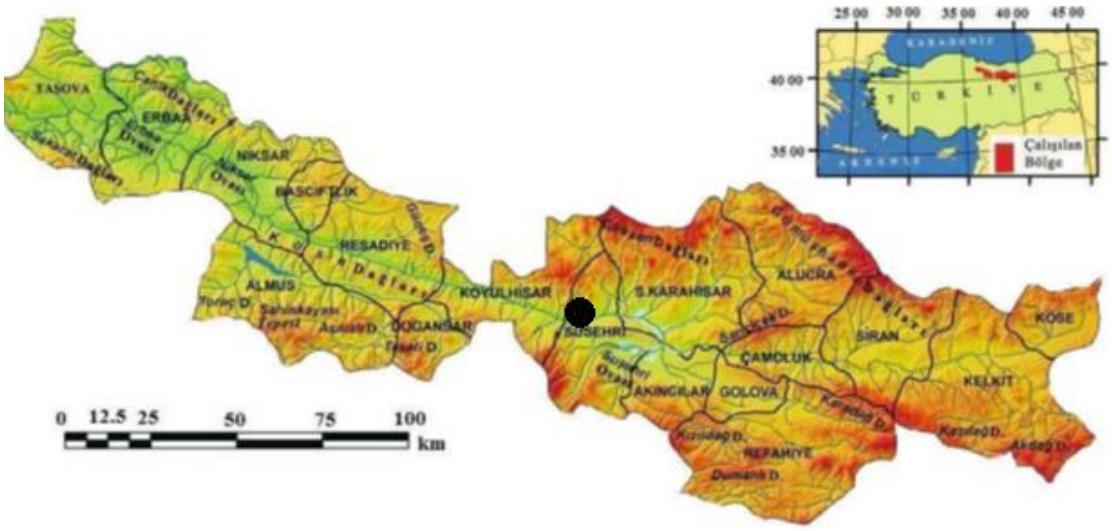

Fig. 1. Collecting locality from Kelkit Valley in Black Sea Region of Turkey.

Results

Kishidaia conspicua (L. Koch, 1866) (Figs. 2-3)
Melanophora conspicua L. Koch, 1866: 149, pl. 6, f. 90, 92 (D♂).
Poecilochroa conspicua Simon, 1878a: 159 (♀).
Kishidaia conspicua Kamura, 2001b: 199, f. 24-30 (Transferred from *Poecilochroa*).
[For other taxonomic references, see World Spider Catalog (2019)]

Collected specimens: 2♀♀, Sivas Province, Zara District, Şarköy village; 28.V.2019; Leg. Hakan Demir & Osman Seyyar.

Fig. 2. *Kishidaia conspicua* (L. Koch, 1866) ♀ from Kelkit Valley, habitus, dorsal view.

Global distribution: Europe, Caucasus, Russia (Europe to Far East), Central Asia, China (World Spider Catalog, 2019).

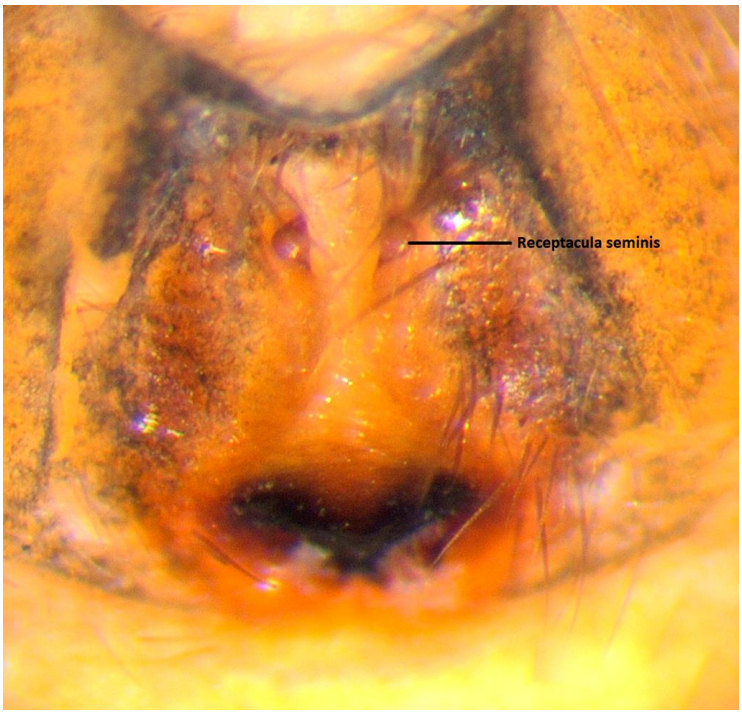

Fig 3. *Kishidaia conspicua* (L. Koch, 1866) ♀, epigyne.

Acknowledgment

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Serket (2019) vol. 17(1): 48-50.

New locality record of *Xysticus pseudolanio* Wunderlich, 1995 (Araneae: Thomisidae) from Turkey

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Abstract

New locality of the crab spider *Xysticus pseudolanio* Wunderlich, 1995 in Turkey is recorded from Central Anatolian Region. Figures of general habitus and palpal organ of this species are given.

Keywords: Araneae, Thomisidae, *Xysticus*, Turkey.

Introduction

Thomisidae, commonly called the crab spiders, is a big spider family comprising 170 genera and 2148 species worldwide (World Spider Catalog, 2019), of which 90 species of 14 genera are known from Turkey (Demir & Seyyar, 2017). Being the largest genus of this family, *Xysticus* C.L. Koch, 1835 is currently containing 294 species with the distribution of all over the world. They have stout bodies with strong legs and are usually found under stones or bark. They bear some resemblance to the genus *Ozyptila* Simon, 1864 but have the median ocular trapezium square or broader than long. The cephalic region is generally furnished with fairly long spines whereas *Ozyptila* has shorter, club-shaped hairs. The abdominal patterns of *Xysticus* tend to be made up of triangles and bars, whereas *Ozyptila* generally have rounded marbling and swirls (Roberts, 1995). Among them, 48 species are known in the Turkish fauna (Demir & Seyyar, 2017). The aim of this paper is to present the new locality record of *Xysticus pseudolanio* Wunderlich, 1995 in Turkey. *X. pseudolanio* is already known from Turkey (Wunderlich, 1995) and Georgia (Otto & Japoshvili, 2018).

Material and Methods

All illustrations were made with a Nikon SMZ-U stereomicroscope with drawing tube. All measurements are in millimetres. The studied specimen is deposited in the Arachnology Museum of Niğde Ömer Halisdemir University, Niğde, Turkey (NOHUAM). Identification of the species depended on Wunderlich (1995) and Otto & Japoshvili (2018).

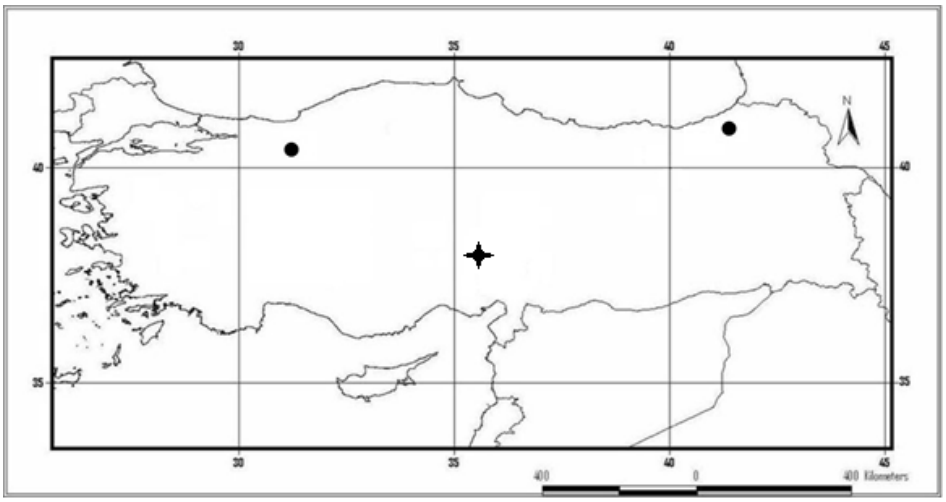
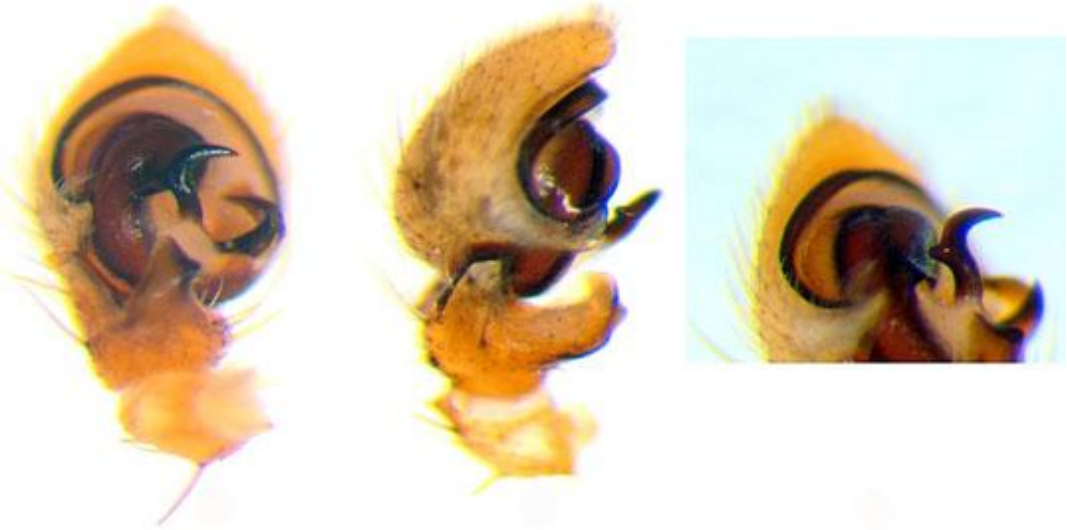


Fig. 1. Map of Turkey showing old localities of *Xysticus pseudolanio* Wunderlich, 1995 in Black Sea region (●) and the new locality in Central Anatolia (✦).

Results

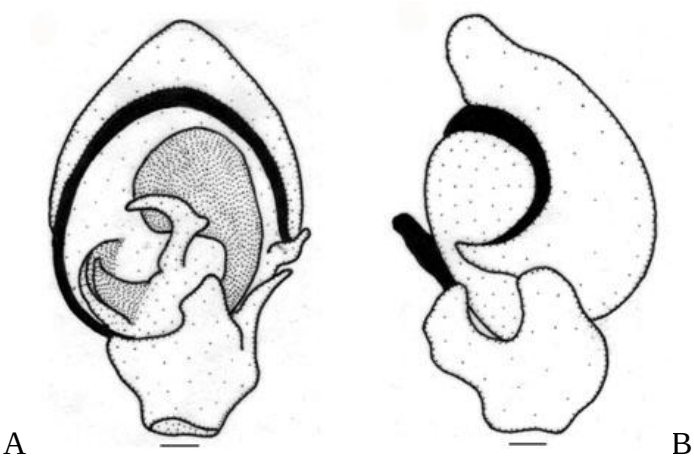
Xysticus pseudolanio Wunderlich, 1995 (Figs. 2-4)
Material Examined. 1♂ (NOHUAM), TURKEY: Kayseri, Sultan Sazlığı, Çayağzı village, 27-05-2005, leg. H. Demir (**New Locality Record**).
Remarks. *X. pseudolanio* was described by Wunderlich (1905) on the basis of only male sex from Bolu and Artvin provinces of Turkey, with no further records reported so far. Thus, *X. pseudolanio* has occurred only in Black Sea Region of Turkey until now. We record it from Central Anatolian Region for the first time.
World distribution: Turkey, Georgia (World Spider Catalog 2019).

Fig. 2. *Xysticus pseudolanio* Wunderlich, 1995 ♂, habitus, dorsal view.



A B C

Fig. 3. *Xysticus pseudolanio* Wunderlich, 1995 ♂. A-C. right palp. A. ventral view. B. retrolateral view. C. ventral view, detail.



A B

Fig. 4. *Xysticus pseudolanio* Wunderlich, 1995 ♂, left palp. A. ventral view. B. retrolateral view. Scale bars: 0.1 mm.

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Serket (2019) vol. 17(1): 51-53.

New locality records of *Trachyzelotes malkini* Platnick & Murphy, 1984 (Araneae: Gnaphosidae) from Turkey

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Abstract

Trachyzelotes malkini Platnick & Murphy, 1984 was recorded before from Ankara, Turkey. This new record is from Gümüşhane Province, Kürtün District. The characteristic features and photographs of *T. malkini* are presented.

Keywords: Araneae, Gnaphosidae, *Trachyzelotes malkini*, new locality record, Turkey.

Introduction

Family Gnaphosidae is one of the largest spider families, containing 2534 species in 158 genera worldwide (World Spider Catalog, 2019). In the Turkish fauna, there are 147 species in 32 genera recorded so far (Demir & Seyyar, 2017; Danışman *et al.*, 2019). This new locality record widens the scope of distribution of this species in Turkey.

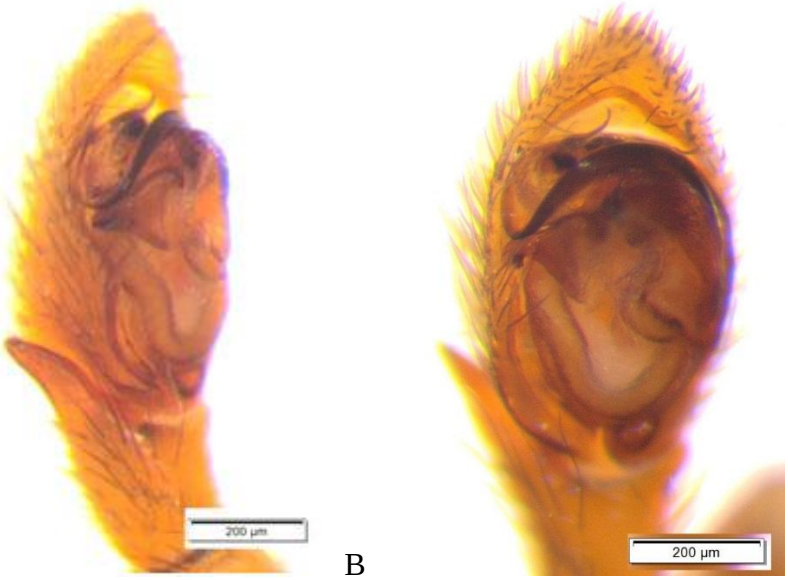
Material and Methods

In this study, the specimens were obtained from under stones in the North of Turkey. They were preserved in 70% ethanol. The identification of species depended on: Platnick & Murphy (1984) and Kovblyuk (2004). The identification was made by means of a SZX61 Olympus stereomicroscope. Examined specimens were deposited in the NÖHUAM (Niğde Ömer Halisdemir University Arachnological Museum).

Results

Trachyzelotes malkini Platnick & Murphy, 1984
Material examined: 2♂♂, Gümüşhane Province, Kürtün District, (40°39'801"N, 39°02'043"E), 1282m, 30.06.2009; 1♀, Çorum Province, Sungurlu District, (40°23' 653"N, 34°16'673"E) 705m, 20.05.2008 (T. Türkeş).
Description of male: Body length 5-5.5 mm. Prosoma dark brown. Legs dark brown, but tarsi are yellow. Opisthosoma dark brown (Fig. 1). Retrolateral loop of embolar base occupying about half of bulb length (Fig. 2).
Description of female: Body length 7.5 mm. Prosoma dark brown. Legs dark brown, but tarsi are greyish brown. Opisthosoma greyish brown (Fig. 3). Epigyne as in Fig. (4).
Distribution: Romania, Albania, North Macedonia, Bulgaria, Greece, Ukraine, Russia (Europe, Caucasus), Turkey, Iran, Kazakhstan (World Spider Catalog, 2019). In Turkey: Ankara Province, Çorum Province, and Gümüşhane Province (**New Locality Records**).
Habitat: The specimens were found under stones.

Fig. 1. *Trachyzelotes malkini* Platnick & Murphy, 1984 ♂. Habitus, dorsal view.



A B

Fig. 2. *Trachyzelotes malkini* Platnick & Murphy, 1984 ♂, palpal organ. A. retrolateral view. B. ventral view.

Fig. 3. *Trachyzelotes malkini* Platnick & Murphy, 1984 ♀. Habitus, dorsal view.

Fig. 4. *Trachyzelotes malkini* Platnick & Murphy, 1984 ♀. Epigyne ventral view.

Acknowledgment

We are very grateful to the Scientific and Technological Research Council of Turkey (TÜBİTAK) for financial support of this work (Project No. KBAG:107T017).

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Cithaeron praedonius O. Pickard-Cambridge, 1872 (Araneae: Cithaeronidae) in Cyprus

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Abstract

New locality record has been given to the cithaeronid spider species *Cithaeron praedonius* O. Pickard-Cambridge, 1872 from Cyprus. Some diagnostic photographs of the species are also provided.

Keywords: Araneae, Cithaeronidae, curly-legged spiders, pseudosegmentation, swift ground spiders, Cyprus.

Introduction

Family Cithaeronidae is currently represented by eight species from two genera: *Cithaeron* O. Pickard-Cambridge, 1872 and *Inthaeron* Platnick, 1991. *Cithaeron praedonius* O. Pickard-Cambridge, 1872 is a spider with wide distribution from North Africa to the Mediterranean basin and extending eastwards to the Oriental region. It is also known that this species is introduced to USA, Latin America (Brazil, Cuba), and Australia (World Spider Catalog, 2019). The purpose of this short faunistic note is to expand the distribution of *C. praedonius* in Cyprus.

During the preparation of this article for publication, *C. praedonius* was recorded by Bosmans *et al.* (2019) from Nicosia district, Cyprus. The purpose of this short faunistic note is to expand the distribution of *C. praedonius* in Cyprus.

Material and Methods

During field trips to identify the arachnid fauna of Cyprus, a female *C. praedonius* was trapped. The specimen was washed out in order to remove ethylene glycol, which was placed as a killing and protection solution in pitfall traps, and placed into ethanol. The epigyne was transferred to lactic acid solution after dissection in order to ensure the transparency. Species identification was made using a Leica S8AP0 stereomicroscope and genotype drawings given in Platnick (1991) were used for the diagnosis of the species.

Leica DFC295 camera was used for photographing the related diagnostic anatomical parts, and 2-10 photographs were taken at different focal points from the same frame in order to obtain the sharpest image using Combine ZP-Picture stacking software. After editing the photos with Adobe Photoshop CC software, a plate was prepared using Corel-DRAW X8 software. SEM microphotographs were made from dried and sputter coated, by gold, organs using a Zeiss Ultra Plus SEM device in Eskişehir Technical University, Eskişehir, Turkey.

As the specimen was heavily deformed, morphometric leg measurements were not possible, and the spinnerets which were one of the characteristics of the species could not be photographed. All measurements in the text are in mm.

Taxonomy

Family **Cithaeronidae** Simon, 1893
Genus ***Cithaeron*** O. Pickard-Cambridge, 1872
Cithaeron praedonius O. Pickard-Cambridge, 1872
(Figs. 1-2)

Examined material: 1♀, Cyprus, Beşparmak Mountains, Kantara Castle Hwy. (35°22'58.00"N, 33°52'30.00"E), maquis shrubland, asl c. 608 m, 21 April - 24 August 2018, leg. K.B. Kunt & S. Gücel.
Measurements: Total length 6.30, carapace length 2.50, and width 2.20.

Fig. 1. *Cithaeron praedonius*, lateral view of legs II.

Description: Carapace, gnathocoxae and labium brown. There is a relatively darker area along the midline that crosses the head and thoracic region, from the front margins of the carapace to the back margins.

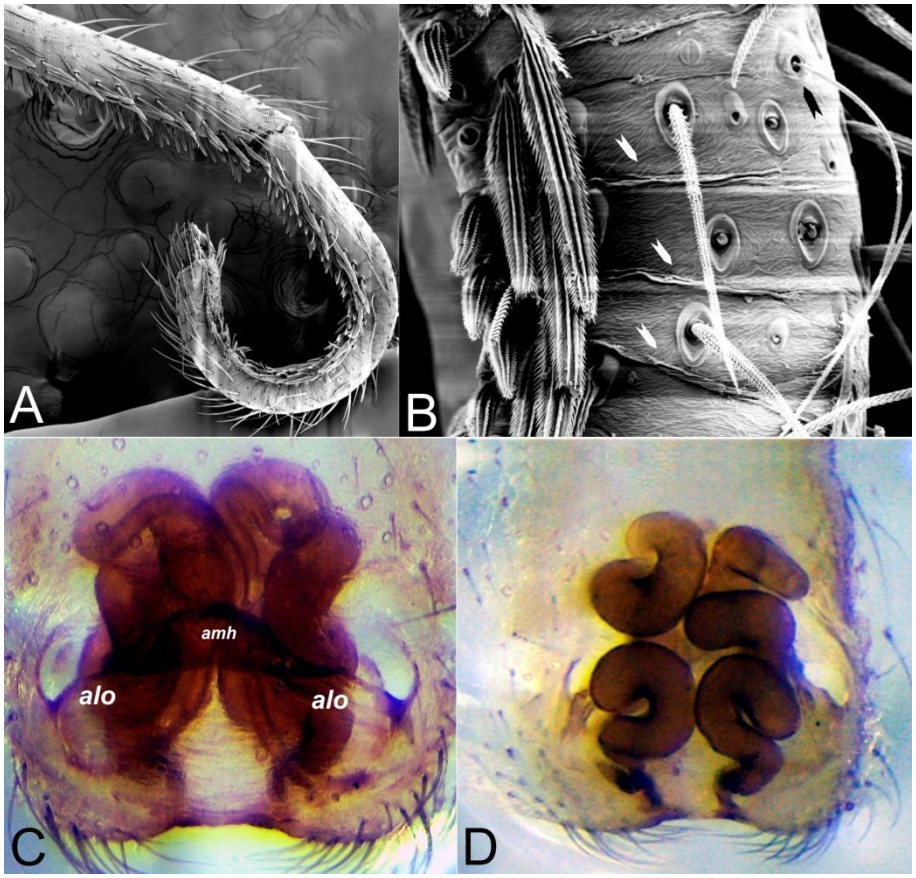

Fig. 2. *Cithaeron praedonius*. A. Tarsus and metatarsus I. B. Tarsus I, white arrows indicate pseudosegments, black arrow indicates trichobothrium on tarsus. C-D. Vulvae. C. ventral view. D. dorsal view. *alo* = anterolateral opening, *amh* = anteromedian hood.

The chelicerae are darker than other parts of the prosoma. The length of the labium is more than half the size of the gnathocoxae. Anterior surface of the chelicerae, the front tips and the surfaces of the labial and gnathocoxae, the ventral surfaces of the sternum, and the coxae are covered with blackish hairs which are not very frequent. The legs are brownish, similar to the overall body colour. There is one short spine on the dorsal surface of the 2nd and 4th femora.
The tarsi of all legs curve inwards due to the pseudosegmentation (Figs. 1, 2A). Tarsi and metatarsi possess ventral scopulae. Tarsal scopulae are well developed. There are also trichobothria sequences on the dorsal surface of the tarsi and metatarsi (Fig. 2B). Abdomen is brownish and the surface is covered with blackish short hairs. The female reproductive organ consists of an anteromedian positioned sclerotized hood on the ventral side and a pair of symmetrically accompanying openings and a complex, intermingled tubing system along the dorsal side (Figs. 2C, D).

Acknowledgments

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A new *Zelotes* record from Turkey (Araneae: Gnaphosidae)

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Abstract

This short paper reports a ground spider species which is new for the Turkish araneo-fauna. The characteristic features and photographs of *Zelotes babunaensis* (Drensky, 1929) are presented. With this species, the number of species belonging to genus *Zelotes* has been raised to 32 in Turkey.

Keywords: Araneae, Gnaphosidae, *Zelotes babunaensis*, new record, Turkey.

Introduction

Gnaphosidae is a large family comprising 158 genera and 2534 species occurring in the world (World Spider Catalog, 2019). There are 147 species in 32 gnaphosid genera listed for Turkey (Danışman *et al*., 2019). With latest records, the number of gnaphosid species in Turkey has increased to 149 in the same 32 genera due to the following studies: Seyyar *et al.* (2017) recorded *Setaphis parvula* (Lucas, 1846), Coşar *et al.* (2017) recorded *Drassodes caspius* Ponomarev & Tsvetkov, 2006. Together with the species in this study the number of gnaphosid species belonging to Turkish spider fauna has raised to 150 including 32 *Zelotes* species.

Material and Methods

One male specimen was examined in this study. The specimen was taken through leaf litter by means of hand aspirator and sifter. The identification and photographing of the sample was performed by a Leica DC160 camera attached to a Leica S8AP0

stereomicroscope and identification mainly depended on Senglet (2011). Images were montaged using "CombineZM" image stacking software and "Photoshop CS5" image editing software. Measurements are given in millimetres. The studied sample was preserved in 70% ethanol and deposited in the collection of the Arachnological Museum of Kırıkkale University (KUAM).

Results

Zelotes babunaensis (Drensky, 1929)

Material examined: 2♂♂, Muğla Province, Seydikemer District, Göğübeli pass (36°84'N, 29°74'E), 20.06.2017, 1850 m.

Distribution: North Macedonia, Greece, Iran (World Spider Catalog, 2019).

Description: Total length 4.2. Prosoma 2.0 long, 1.5 wide. Abdomen 2.2 long, 1.7 wide. While close to ocular area part is brown, the remaining parts of prosoma are yellowish brown and covered with short dark colour hairs (Fig. 1A). Clypeus is light brown and narrow. Chelicerae light brown and bright hairy dorsally (Fig. 1B). Abdomen is whitish gray and intensely covered with dark hairs, with scutum on first 1/6 from the front (Fig. 1A). The ventral side of abdomen whitish gray and intensely covered with short brown hairs. Spinnerets light brown.

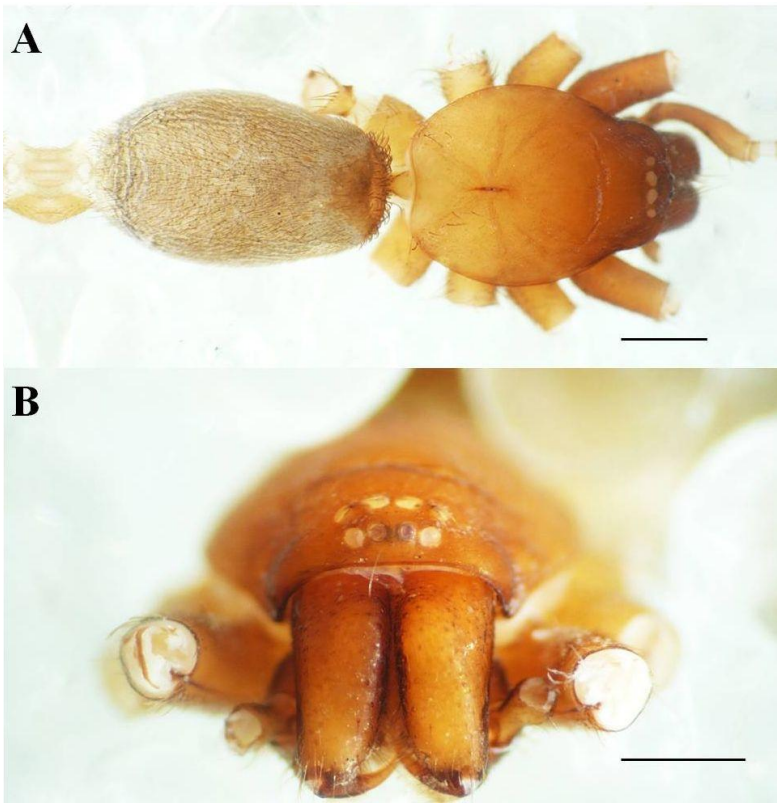

Fig. 1. *Zelotes babunaensis* (Drensky, 1929) ♂. A. habitus, dorsal view. B. ocular area, frontal view. (Scale: 0.5)

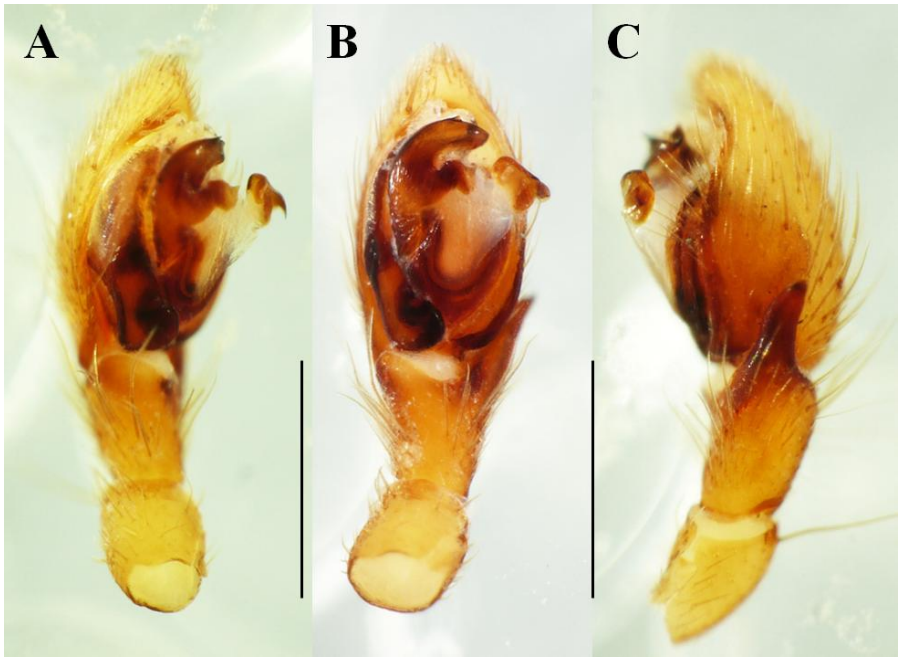

Fig. 2. *Zelotes babunaensis* (Drensky, 1929) ♂, palp. A. prolateral view. B. ventral view. C. retrolateral view. (Scale: 0.5)

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Diversity of spiders (Arachnida: Araneae) from Central Aravalli Ranges, Rajasthan, India

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Abstract

The Aravalli mountain ranges, India's oldest mountains, have vibrant and high endemic biodiversity, because of its position between arid and semi-arid regions of western India. The region is devoid of studies on spiders. We assessed the spider diversity in two districts, Pali and Ajmer of central Rajasthan. In total, 116 species of 22 families from both the sites were found, Pali and Ajmer have 85 and 77 species, respectively. The current study is a preliminary approach to assess the spider fauna in the study area, which needs to be focused more by researchers in the same context.

Keywords: Arachnofauna, Pali, Ajmer, Central Rajasthan, Dry Deciduous Forests, India.

Introduction

High number of endemic species has been observed in all biogeographic zones of India (Chitale *et al*., 2014). Mountain and hill ranges dominantly cover seven of the ten biogeographic zones (MoEF, 2014). There is dominance of highlands in biogeographic zones in India. However, there is less number of studies on diversity assessment in many mountain dominated regions in India, such as Aravalli mountain range. Aravalli is the oldest mountain chain of India, which expands in four states, *i.e.*, Delhi, Haryana, Rajasthan, and Gujarat. Rajasthan owns the longest stretch of the hilly folds (GSI, 2011).

Geographically, the Aravalli cordillera plays a critical role in keeping distinct from the eastern semi-arid zone to the western arid zone (Singh & Joshi, 1990). These mountain host a vast diversity of flora and fauna, which includes100 species of butterflies (5 families), 71 species of spiders (15 families), 12 species of frogs (4 families), 16 species of lizards (6 families), 20 species of snakes (5 families), 263 species of birds (53 families), 42 species of mammals (20 families), and 603 species of higher plants (88 families (Chhangani, 2002; FES, 2010a; FES, 2010b; GSI, 2011; Kashmeera & Sudhikumar, 2019). With such huge range of diversity, the landscape is still lacking the studies on the faunal diversity assessment and their ecological aspects, especially lower animal taxa. In lower fauna, spiders are considered as indicators of ecosystem and land use pattern and also act as a predator for many pests (Clausen, 1986).

The present study is objected to assess the spider diversity in two districts of Rajasthan (Pali and Ajmer), which hold different geological and physical properties. Also, this research will aid to update the checklist of spiders of Central Aravalli mountain ranges and foothills.

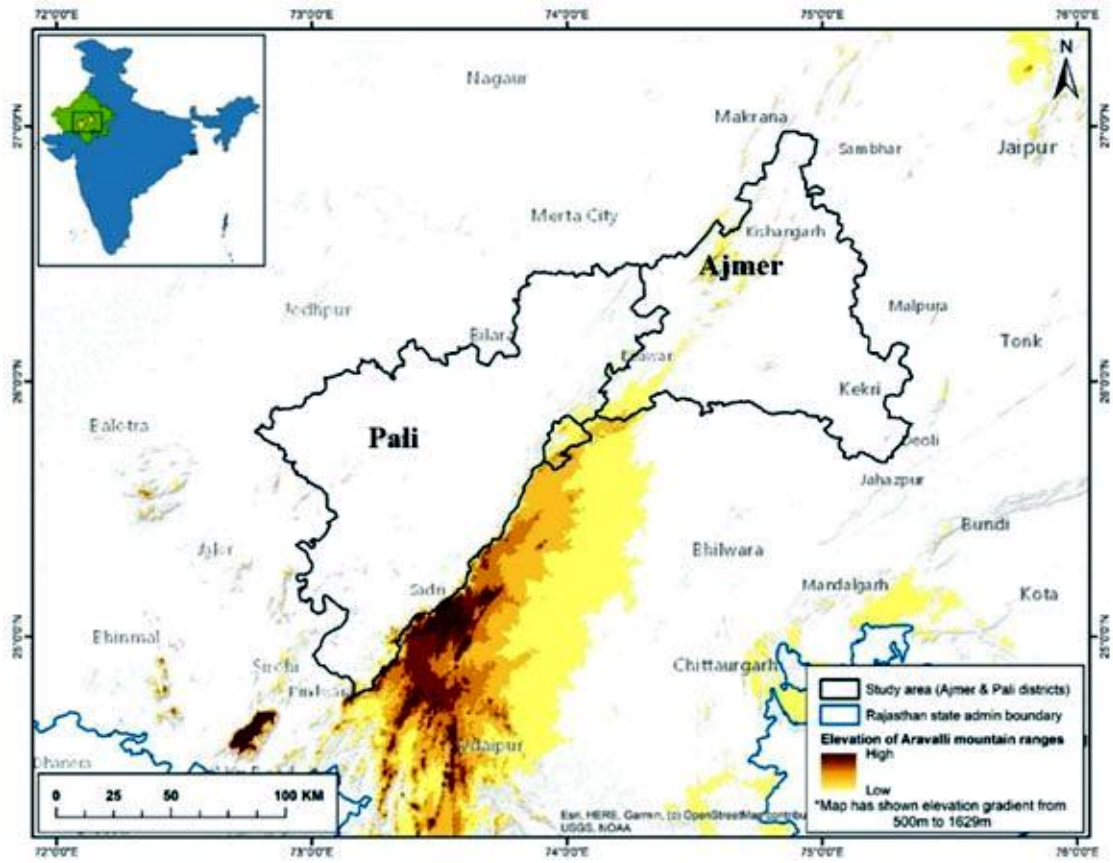

Fig. 1. Map showing the study area, focusing on Pali and Ajmer districts in Rajasthan state of India.

Study area

This study emphasizes on Central Aravalli ranges of Rajasthan, geographically covered by two districts: Pali (Area 12387km^2; 74.390ºN, 26.498ºE - 72.822ºN, 24.750ºE; Mean annual rainfall 462mm; Mean annual temperature 26.6ºC) and Ajmer (Area 8481km^2; 75.294ºN, 27.010ºE - 74.105ºN, 25.872ºE; Mean annual rainfall 557mm; Mean annual temperature 24.7ºC (Fig. 1) (IMD, 2018). The districts have 253km^2 of

moderate forests (Pali: 210km^2 & Ajmer: 43km^2), 720km^2 of open forests (Pali: 464km^2 & Ajmer: 256km^2) and 510km^2 of scrubland (Pali: 308km^2 & Ajmer: 202km^2; FSI, 2015). Both districts are superficially similar in concern of forest type as dry deciduous forests (Champion & Seth, 1968).

The arrangement of hillocks varies within both the sites, Pali has a continuous chain of range with dominantly covered by semi-arid zones whereas Ajmer is surrounded by mountains forming the shape of the bowl and it has partial overlap of an arid region towards the western side with integration of the semi-arid region in east. The difference between terrain & habitat complexity, variations of temperature & rainfall allow various unique diversity to propagate (Tew *et al*., 2004; Thuiller *et al*., 2006), which aided the study to make comparable. For protecting the diversity, a chain of protected area networks has been established, where Todgarh-Raoli WLS (Area 475.23km^2), Jawai Bandh Conservation Reserve (Area 19.78km^2), Kumbhalgarh WLS (Area 610.53km^2) and Phulwari ki Nal WLS (Area 511.4km^2) are included (RSBB, 2019).

Methods

The study has been implemented in both urban as well as forest areas. The *ad libitum* method was used to assess the presence-data collection of spiders in the study area (Vedel *et al*., 2013). Spiders were sampled during the tenure of two years from June 2015 to May 2017 in both the districts simultaneously. Hand-picking and bush beating methods were executed for the sampling of the spiders. To find the nocturnal spiders, we observed eye shine of the spiders using torchlight on the ground (Benson & Suter, 2013).

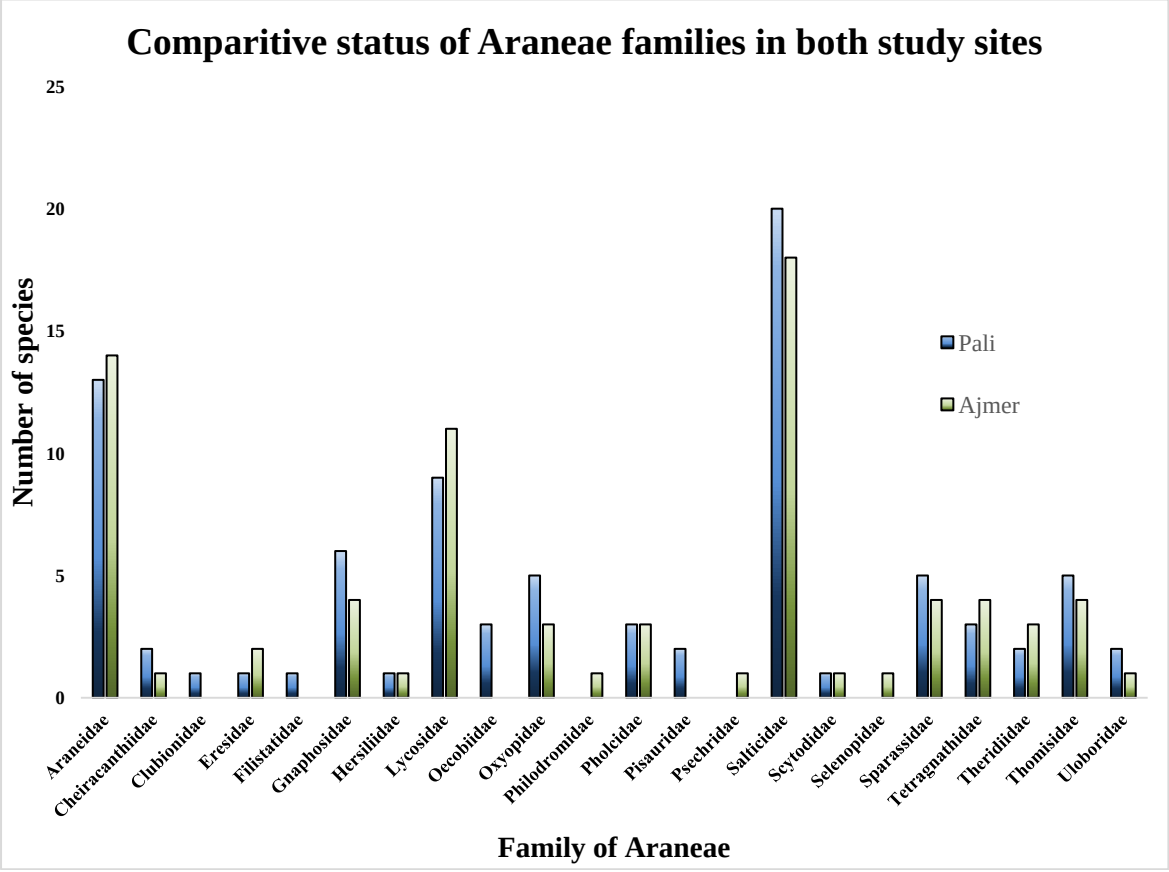

Fig. 2. Comparative status of families of Araneae observed in study area in Rajasthan.

Table 1. Checklist of spider species with occurrence in Pali and Ajmer districts in Rajasthan state of India.

Family	Species	Common Name	Occurrence in *	
			Pali	Ajmer
Araneidae	*Araneus mitificus* (Simon, 1886)	Kidney-shaped Garden Orb-weaver Spider	1	1
	Araneus sp. 1	Common Orb-weaving Spider	1	0
	Araneus sp. 2	Common Orb-weaving Spider	0	1
	Argiope anasuja Thorell, 1887	Giant Cross Spider	1	1
	Argiope lobata (Pallas, 1772)	Lobed Cross Spider	0	1
	Cyclosa bifida (Doleschall, 1859)	Long-bellied Cyclosa Spider	1	1
	Cyclosa hexatuberculata Tikader, 1982	Island Cyclosa Spider	1	0
	Cyrtophora cicatrosa (Stoliczka, 1869)	Garden Tent Web Spider	0	1
	Cyrtophora citricola (Forsskål, 1775)	Jungle Tent-web Spider	0	1
	Cyrtophora exanthematica (Doleschall, 1859)	Double-tailed Tent Spider	1	1
	Eriovixia excelsa (Simon, 1889)	Dark Bird-dropping Spider	1	1
	Gasteracantha diadesmia Thorell, 1887	Oriental Spiny Orb-weaver Spider	1	0
	Larinia chloris (Savigny, 1825)	Chloris Orb-weaver Spider	1	0
	Neoscona bengalensis Tikader & Bal, 1981	Spotted Orb-weaver Spider	1	1
	Neoscona crucifera (Lucas, 1838)	Crucifer Orb-weaver Spider	0	1
	Neoscona mukerjei Tikader, 1980	Common Garden Orb-weaver Spider	1	0
	Neoscona nautica (L. Koch, 1875)	Grey-sphere Orb-weaver Spider	0	1
	Neoscona theisi (Walckenaer, 1841)	Theisi Orb-weaver Spider	1	1
	Nephila pilipes (Fabricius, 1793)	Giant Wood Spider	1	0
	Parawixia sp.	Abandoned Web Spider	0	1
Cheiracanthiidae	*Cheiracanthium danieli* Tikader, 1975	Yellow Sac Spider	1	1
	Cheiracanthium melanostomum (Thorell, 1895)	Dark Sac Spider	1	0
Clubionidae	*Clubiona* sp.	Sac Spider	1	0
Eresidae	*Stegodyaphus pacificus* Pocock, 1900	Pacific Social Spider	0	1
	Stegodyphus sarasinorum Karsch, 1892	Common Social Spider	1	1
Filistatidae	*Pritha* sp.	Crevices Spider	1	0
Gnaphosidae	*Callilepis rajasthanica* Tikader & Gajbe, 1977	Rajasthan's Mouse Spider	1	0
	Drassodes parvidens Caporiacco, 1934	Parvidens Mouse Spider	1	1
	Drassodes sp.	Mouse Spider	1	0
	Eilica tikaderi Platnick, 1976	Tikader's Mouse Spider	0	1
	Gnaphosa jodhpurensis Tikader & Gajbe, 1977	Jodhpur Mouse Spider	1	0
	Gnaphosa kailana Tikader, 1966	Kailana Mouse Spider	1	0
	Gnaphosa sp.	Mouse Spider	0	1
	Zelotes ashae Tikader & Gajbe, 1976	Ashae Mouse Spider	1	1
Hersiliidae	*Hersilia savignyi* Lucas, 1836	Two-tailed Spider	1	1
Lycosidae	*Evippa banarensis* Tikader & Malhotra, 1980	Banar Mouse Spider	1	1
	Hippasa agelenoides (Simon, 1884)	Common Funnel-web Spider	1	1
	Hippasa pisaurina Pocock, 1900	Pisaura Funnel-web Spider	1	0
	Hippasa sp.	Funnel-web Spider	0	1
	Lycosa bistriata Gravely, 1924	Bistriated Wolf Spider	1	1
	Lycosa mackenziei Gravely, 1924	Soil Wolf Spider	1	1
	Lycosa pictula Pocock, 1901	Pictula Wolf Spider	0	1
	Lycosa tista Tikader, 1970	Grassland Wolf Spider	1	1
	Lycosa sp.	Wolf Spider	0	1
	Pardosa birmanica Simon, 1884	Dark Wolf Spider	1	0
	Pardosa pseudoannulata (Bösenberg & Strand, 1906)	Pond Wolf Spider	1	1
	Pardosa pusiola (Thorell, 1891)	Spotted Wolf Spider	1	1
	Wadicosa fidelis (O. Pickard-Cambridge, 1872)	Fidelis Wolf Spider	0	1
Oecobiidae	*Oecobius* sp. 1	Star-legged Spider	1	0
	Oecobius sp. 2	Star-legged Spider	1	0
	Uroctea indica Pocock, 1900	Indian Spiny Orb-weaver Spider	1	0
Oxyopidae	*Oxyopes birmanicus* Thorell, 1887	Crossed Lynx Spider	1	1
	Oxyopes javanus Thorell, 1887	Javan Lynx Spider	0	1
	Oxyopes shweta Tikader, 1970	White Lynx Spider	1	0
	Oxyopes sp. 1	Lynx Spider	1	0
	Oxyopes sp. 2	Lynx Spider	1	0
	Peucetia viridana (Stoliczka, 1869)	Green Lynx Spider	1	1
Philodromidae	*Philodromus* sp.	Elongated Crab Spider	0	1
	Thanatus lanceoletus Tikader, 1966	False Philodromid Crab Spider	1	1

Pholcidae	*Artema atlanta* Walckenaer, 1837	Oval Dady Long-legged Spider	1	1
	Crossopriza lyoni (Blackwell, 1867)	Box Spider	1	1
	Pholcus phalangoides (Fuesslin, 1775)	Long-bodied Cellar Spider	1	1
Pisauridae	*Dolomedes* sp.	Nursery Web Fishing Spider	1	0
	Nilus sp.	Nursery Web Spider	1	0
Psechridae	*Psechrus* sp.	Tube Web Spider	0	1
Salticidae	*Aelurillus* sp.	Aelurillus Jumping Spider	1	1
	Brettus sp.	Crescented Jumping Spider	0	1
	Epeus tener (Simon, 1877)	Orange Crested Jumping Spider	1	1
	Epeus sp.	Crested Jumping Spider	0	1
	Epocilla aurantiaca (Simon, 1885)	Jolly Epocilla Jumping Spider	1	1
	Epocilla sirohi Caleb, Chatterjee, Tyagi, Kundu & Kumar, 2017	Sirohi's Orange Jumping Spider	1	0
	Hasarius adansoni (Audouin, 1825)	Adanson's House Jumping Spider	1	1
	Hasarius sp.	House Jumping Spider	1	0
	Hyllus semicupreus (Simon, 1885)	Heavy-bodied Jumping Spider	1	1
	Marpissa decorata Tikader, 1974	Marpissa Jumping Spider	0	1
	Menemerus bivittatus (Dufour, 1831)	Common Wall Jumping Spider	1	1
	Mogrus rajasthanensis Caleb, Chatterjee, Tyagi, Kundu & Kumar, 2017	Rajasthan's Mogrus Jumping Spider	1	0
	Myrmarachne sp.	Ant-mimicking Jumping Spider	1	0
	Phidippus sp.	Bold Jumping Spider	0	1
	Phintella vittata (C.L. Koch, 1846)	Banded Phintella Jumping Spider	1	0
	Plexippus paykulli (Audouin, 1825)	Common Zebra Jumping Spider	1	1
	Plexippus petersi (Karsch, 1878)	Small Zebra Jumping Spider	1	0
	Rhene albigera (C.L. Koch, 1846)	Albigera Beetle Jumping Spider	1	1
	Stenaelurillus arambagensis (Biswas & Biswas, 1992)	Arambagh's Jumping Spider	0	1
	Telamonia dimidiata (Simon, 1899)	Two-striped Jumping Spider	1	1
	Telamonia sp.	Jumping Spider	1	0
	Thyene imperialis (Rossi, 1846)	Imperial Thyene Jumping Spider	1	1
	Salticidae sp. 1	Jumping Spider	1	0
	Salticidae sp. 2	Jumping Spider	1	0
	Salticidae sp. 3	Jumping Spider	1	0
	Salticidae sp. 4	Jumping Spider	0	1
	Salticidae sp. 5	Jumping Spider	0	1
	Salticidae sp. 6 (sp. nov. in publication)	Jumping Spider	0	1
Scytodidae	*Scytodes pallida* Doleschall, 1859	Yellow Spitting Spider	1	1
Selenopidae	Selenopidae sp.	Flat Wall Crab Spider	0	1
Sparassidae	*Heteropoda nilgirina* Pocock, 1901	Giant Litter Huntsman Spider	1	0
	Heteropoda venatoria (Linnaeus, 1767)	Common House Huntsman Spider	1	1
	Heteropoda sp.	Huntsman Spider	0	1
	Olios milleti (Pocock, 1901)	Green Crab Huntsman Spider	1	1
	Olios tener (Thorell, 1891)	Giant Crab Huntsman Spider	1	1
	Olios sp.	Giant Crab Huntsman Spider	1	0
Tetragnathidae	*Guizygiella indica* (Tikader & Bal, 1980)	Indian Long-jawed orb-weaver Spider	1	1
	Leucauge decorata (Blackwall, 1864)	Three-humped Leucauge Spider	1	1
	Tetragnatha mandibulata Walckenaer, 1841	Dark Tetrgnathid Spider	1	1
	Tetragnatha sp.	Long-jawed orb-weaver Spider	0	1
Theridiidae	*Argyrodes gazedes* Tikader, 1970	Parasitic Comb-footed Spider	1	1
	Steatoda sp.	Cupboard Spider	0	1
	Theridion indicum Tikader, 1977	Indian Cob-web Spider	0	1
	Theridion sp.	Cobweb Spider	1	0
Thomisidae	*Indoxysticus minutus* (Tikader, 1960)	Brown Crab Spider	1	1
	Misumena sp.	Yellow Flower Crab Spider	1	0
	Thomisus lobosus Tikader, 1965	White Crab Spider	1	1
	Thomisus sp.	Pink Crab Spider	1	0
	Tmarus sp.	Tuberclated Crab Spider	0	1
Uloboridae	*Uloborus* sp.	Humped Spider	1	0
	Zosis geniculata (Olivier, 1789)	White kneed Spider	1	1

* “1” denotes that the site is occupied by the species.
“0” denotes the absence of the species at the site.

For diurnal spiders, we looked each possible habitat strata for the spiders, such as crevices of dry logs, grooves between rocks, ground grasses, and crops, near water bodies, under foliage, under gravels, under leaf litters, corners of infrastructures etc. (Parmar & Patel, 2015). The same individual was not collected repeatedly, because we were intended to assess the presence of the species only. The individuals were preserved in labelled bottles with 70% Ethyl alcohol and collected specimens were observed under stereomicroscope Olympus SZ10. High definition photography of their ocular arrangements, general appearance, palps of males, and epigynes of females were captured, and based on these pictures, efforts to identify up to species level were applied (Jocqué & Dippernaar-Schoeman, 2006; Prajapati *et al.*, 2016).

Results and Discussion

A total of 116 species belonging to 22 families has observed from both the sites, out of which 46 species (39.65%) were found common between both the sites though 39 (33.62%) and 31 (26.72%) species were found unique to Pali and Ajmer, respectively (Table 1; Fig. 2).

The current study develops the comparative checklist of spiders from central Rajasthan as a preliminary assessment to initiate enlisting the species. As both regions have different terrain and vegetation properties, so there is a need to compare the diversity of ecosystem indicator taxa such as spiders. The checklist is comparable with some previous studies from Kumbhalgarh Wildlife Sanctuary (25 species by FES, 2010a), Sitamata Wildlife Sanctuary (18 species by FES, 2010b), Desert National Park (28 species by Sivaperuman & Rathore, 2004 and 7 soil spiders by Patil *et al*., 2016), and Ranthambhore National Park (12 species by Saha *et al*., 2015) in Rajasthan. Species diversity was found more abundant than mentioned by the previous studies in the protected areas. The inadequate assessment in the protected areas might be one of the reasons for less spider diversity. Therefore, adequate scientific research is needed to be done for the taxonomy of spiders.

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Selenops spiders in Egypt (Araneae: Selenopidae)

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Abstract

Two *Selenops* species are known from Egypt: *S. radiatus* Latreille, 1819 and *S. bastet* Zamani & Crews, 2019; both of them without precise locality in Egypt, except Wadi Natron. This work presents a locality for the first species with illustrations of the available specimens of *S. radiatus* collected from Serohit and Menouf in Nile Delta.

Keywords: Araneae, Selenopidae, *Selenops radiatus*, Egypt.

Introduction

Family Selenopidae was established by Eugène Simon in 1897 as subfamily Selenopinae of family Clubionidae including a single genus, *Selenops* Latreille, 1819 (Simon, 1897). Now, Selenopidae includes 259 species of 9 genera (World Spider Catalog, 2019):

1. *Amamanganops* Crews & Harvey, 2011 [1 sp.: Philippines]
2. *Anyphops* Benoit, 1968 [64 spp.: sub-Saharan Africa]
3. *Garcorops* Corronca, 2003 [3 spp.: Comoros, Madagascar]
4. *Godumops* Crews & Harvey, 2011 [1 sp.: New Guinea]
5. *Hovops* Benoit, 1968 [11 spp.: Madagascar]
6. *Karaops* Crews & Harvey, 2011 [37 spp.: Australia]
7. *Makdiops* Crews & Harvey, 2011 [5 spp.: India, Nepal]
8. *Selenops* Latreille, 1819 [131 spp.: Africa, Middle East, Asia, North & South America]
9. *Siamspinops* Dankittipakul & Corronca, 2009 [6 spp.: Malaysia, Taiwan, Thailand]

Genus *Selenops* includes about 50% of known selenopid species and is recorded from tropical and sub-tropical regions of the world except Australia.

Selenops spiders are easily recognized by their flatness and by their "eye arrangement, having six eyes in the front row; the posterior median eyes have moved laterally and forward" (Kaston, 1980: 227). The four median eyes are in the middle of the anterior row of eyes (Fig. 1).

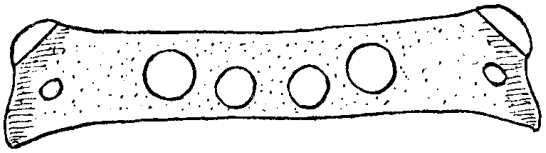
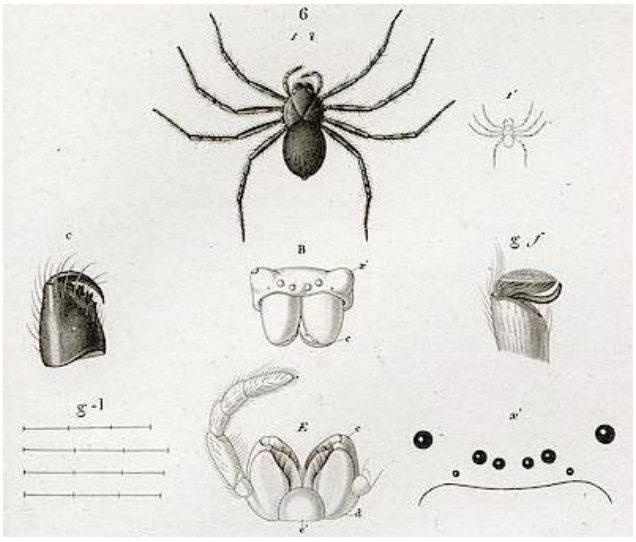


Fig. 1. *Selenops radiatus* Latreille, 1819. Face and eyes. (After Simon, 1897: f. 19)

The first record of *Selenops radiatus* Latreille, 1819 in Egypt was by Savigny & Audouin (Audouin, 1825: 162-163, pl. 6, f. 6) who described a female as a new species, *Selenops aegyptiaca* (Fig. 2).

2 

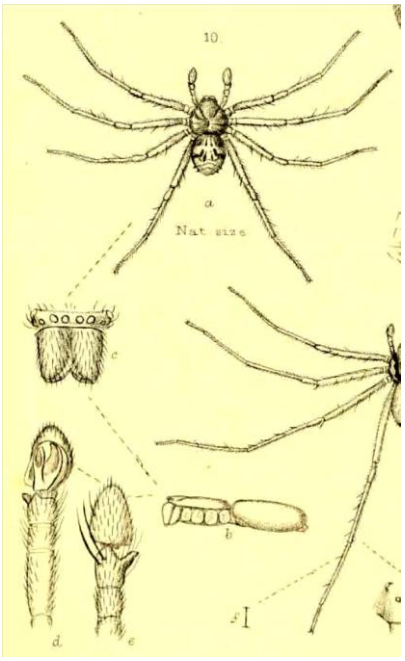
3 

Fig. 2. *Selenops aegyptiaca*. (After Audouin, 1825: pl. 6, f. 6)
Fig. 3. *S. aegyptiaca*. (After Pickard-Cambridge, 1876: pl. 59 f. 10)

In 1876, the Reverend Octavius Pickard-Cambridge described the male of *Selenops aegyptiaca* in detail with the drawing of the palpal organ (Fig. 3) (Pickard-Cambridge, 1876: 585-587, pl. 59 f. 10). Among his observations he said "This spider appears to be tolerably abundant in the Nile boats; it used frequently to be seen at night in the cabins and passages of our daha-beah [A big boat], but, owing to its swift movements and the numerous cracks and crevices at hand, it was very difficult to capture it; I managed however, to obtain three adult and immature females and several adult males. As no other species was met with during my stay in Egypt, I conclude that this is probably the one described and figured by Savigny and Audouin" and "This spider is probably common in houses in Egypt, though I did not myself meet with it except in the Nile boats. According to the sailors' account, it preys upon the cockroaches with which these boats are generally infested."

Later, Pavesi (1878: 381) doubtfully mentioned *S. radiata* from "Palestina, Egitto ?" without any comment. But, Simon (1899: 244) identified *Selenops radiatus*

among other species collected by M. C. J. Dewitz in 1898, at Bir-Hooker (Wadi Natron), Egypt.

The aforementioned references were listed in the works of El-Hennawy (1990: 35, 2002: 81, 2006: 74, 2017: 179) stating that the distribution of *S. radiatus* in Egypt is Wadi Natron and Nile Valley.

Recently, Zamani & Crews (2019) revised family Selenopidae in the Middle East to find that Selenopidae is currently represented by two species in the Middle East: *S. radiatus* and *S. oculatus* Pocock, 1898. They also described a new species, *Selenops bastet* from Egypt. Its "Type material. Holotype: ♀, along the Nile between Assouan and Alexandria, Egypt, O. Pickard-Cambridge, 28 January–29 March 1864 (OUMNH-ENT-ARACH-0199-01) ... was found in a bottle (1350) with several specimens of "*S. aegyptiaca*" (now *S. radiatus*) collected by O. Pickard-Cambridge, presumably during his expedition mentioned in his 1876 work which occurred from the middle of January to the middle of April 1864, from Alexandria to Assouan. In his paper (Pickard-Cambridge, 1876) he only mentions collecting *Selenops* on the Nile boats and does not give any additional locality information" (Zamani & Crews, 2019).

The number of specimens obtained by Pickard-Cambridge are "three adult and immature females and several adult males" while Zamani & Crews (2019) state that they are 4♀♀ 8♂♂ 1p♂ 1 imm. (OUMNH bottle 5, tube 10; bottle 1359; bottle 1350) in addition to *Selenops bastet* 's ♀ holotype.

About the River Nile trip of Pickard-Cambridge in 1864, Parker (1991) said: "On the 28th they started on a trip up the River Nile, which in spite of many delays due to lack of wind, brought them much enjoyment and plenty of good shooting and records of birds shot or seen. ... They went upstream as far as Aswan and visited the antiquities en route at Tel el-Amarna, Luxor, Karnak and Philae. The return journey started on March 4th, stopping day by day for shooting and sightseeing, and arrived back in Cairo on the 29th". Thus, the trip was between Cairo and Aswan and vice versa (28 January-29 March 1864).

The purpose of this work is to determine a locality of *Selenops radiatus* in Egypt depending on the available material.

Abbreviations used: AbL = abdomen length, ACE = Arachnid Collection of Egypt, ALE = anterior lateral eye, AME = anterior median eye, CL = carapace length, CW = carapace width, OUMNH = Oxford University Museum of Natural History, Oxford, UK, PLE = posterior lateral eye, PME = posterior median eye, TL = total length.

All measurements are in millimetres (mm).

Family **Selenopidae** Simon, 1897
Genus ***Selenops*** Latreille, 1819
Selenops radiatus Latreille, 1819 (Figs. 4-20)

World Distribution: Mediterranean, Africa, Middle East, India, Myanmar, China (World Spider Catalog, 2019).

Material examined. Egypt, Menoufia Governorate (Mid Nile Delta):
- 1♂ Serohit, Menouf (30°24'26.9"N, 30°59'02.9"E, elev 17 m), 6 March 2018, leg. Dr. Gihan Sallam [ACE.2018.03.06.AR.001].
- 1♂ 1♀ Student hostel of Faculty of Electronic Engineering, Menoufia University, Menouf (30°28'22.57"N, 30°55'30.99"E, elev 17 m), March 1978, leg. Amin SalahEddin [ACE.1978.03.00.AR.001-002].

For a description of *Selenops radiatus* see Latreille (1819), Lessert (1936), Lawrence (1940), Benoit (1968), Corronca (2002), and Zamani & Crews (2019).

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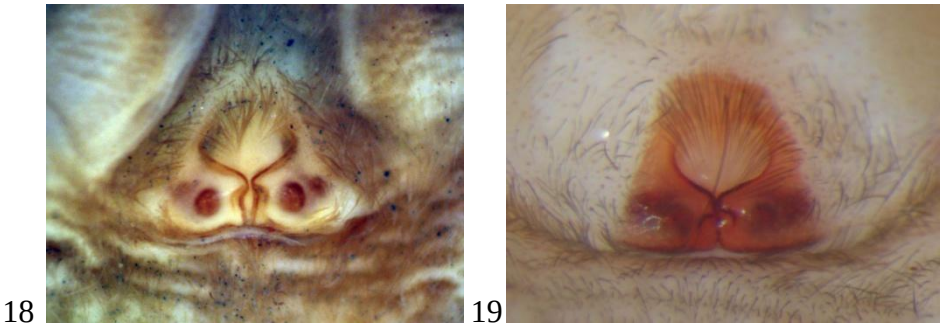
Figs. 4-11. *Selenops radiatus* Latreille, 1819 ♂ [ACE.2018.03.06.AR.001]. 4-5. Habitus. 4. dorsal view. 5. ventral view. 6. Carapace, dorsal view. 7. Eyes in two rows (6: 2). 8. Abdomen, dorsal view. 9. Sternum and coxae of legs. 10. Maxillae and labium. 11. Sternum, posterior margin.

Figs. 12-17. *Selenops radiatus*, male palp. 12-14. retrolateral view. 15-17. ventral view. 12-13, 15-16 [ACE.2018.03.06.AR.001]. 14, 17 [ACE.1978.03.00.AR.001].



Figs. 18-19. *Selenops radiatus*, female epigynum, ventral view. 18. [ACE.1978.03.00. AR.002] from Menouf, Egypt. 19. *Idem*, for comparison, from Saudi Arabia: Ha'il Region: Ash-Shuwayms, 26°13'13"N, 40°24'17"E, 30 July 2010, recorded in Desouky & El-Hennawy (2012) as *Selenops* sp. and mentioned by Zamani & Crews (2019) as first record of *S. radiatus* from Saudi Arabia.

Fig. 20. *Selenops radiatus* ♂, leg tarsus: two claws with claw tuft and scopula.

Measurements:
♂ [ACE.2018.03.06.AR.001] TL 11.3, CL 5.6, CW 6.5, AbL 5.5.

Table 1. Measurements of leg segments of *Selenops radiatus* (♂).

Leg	Femur	Patella	Tibia	Metatarsus	Tarsus	Total
I	6.9	2.9	6.4	6.0	2.5	24.7
II	8.2	3.0	7.7	7.4	2.8	29.1
III	7.7	2.5	6.7	6.4	2.5	25.8
IV	7.7	2.5	6.6	6.8	2.5	26.1

Legs 2431, Femora 2341

Eyes (diameters and inter-distances)
PLE - ALE - PME -AME --- PLE-ALE, ALE-PME, PME-AME, AME-AME, PLE-PME
0.54 0.14 0.22 0.24 0.24 0.38 0.22 0.36 0.7

♂ [ACE.1978.03.00.AR.001]
TL 12.5, CL 6.5, CW 7.0, AbL 5.0. Legs femora: I 8.0, II 9.0, III 9.0, IV 8.2 [2341].
PLE - ALE - PME -AME --- PLE-ALE, ALE-PME, PME-AME, AME-AME, PLE-PME
0.4 0.2 0.24 0.28 0.4 0.34 0.22 0.3 0.76

♀ [ACE.1978.03.00.AR.002]
TL 13.8, CL 6.2, CW 6.5, AbL 7.0. Legs femora: I 6.0, II 7.5, III 7.0, IV 7.0 [2341].
PLE - PME -AME --- PME-AME, AME-AME, PLE-PME
0.4 0.22 0.24 0.2 0.32 0.7
(ALEs are not visible in this specimen.)

Habitat:
The male of Serohit, 6 March 2018, was found running on the floor of a house balcony. Also, the two spiders of the student hostel in Menouf were collected in March inside a building. The two buildings are adjacent to cultivated fields.

Differentiation between *Selenops bastet* and *S. radiatus*:
According to the "*Diagnosis*" of Zamani & Crews (2019), *Selenops bastet* can be separated from *S. radiatus* by the shape of epigyne: the median field extends posteriorly as a lobe between the lateral lobes whereas in *S. radiatus* it does not, the lateral lobes do not touch one another whereas in *S. radiatus* they do, the epigynal pockets are nearly along the caudal margin of the epigyne and extend further anterolaterally whereas in *S.*

radiatus they are along the inner lateral margins of the lateral lobes; by the vulva: the coverings are separate whereas in *S. radiatus* there is only a single covering; the mouthparts: the maxillae are angular laterally rather than parallel as they are in *S. radiatus*.

Distribution of *S. radiatus* in Egypt:
S. radiatus was recorded from a daha-beah [A big boat] sailing between Cairo and Aswan by Pickard-Cambridge (1876), from Bir-Hooker (Wadi Natron) by Simon (1899), and from Serohit and Menouf, Menoufia Governorate (Mid Nile Delta) (Fig. 21).

Fig. 21. Distribution map of *Selenops radiatus* Latreille, 1819 in Egypt (red dots).

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The first author is indebted to his colleague Yusuf SalahEddin who brought him the two specimens collected by his brother Amin SalahEddin in March 1978 from the student hostel in Menouf.

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